

# THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trade

Published every Thursday Morning by David Williams Co., 232-238 William St., New York.

Vol. 67: No. 17.

New York, Thursday, April 25 1901.

\$3.00 a Year, including Postage.  
Single Copies, Ten Cents.

Reading Matter Contents....	page 62
Alphabetical Index to Advertisers ..	139
Classified List of Advertisers ..	141
Advertising and Subscription Rates ..	71



**IRON AND STEEL**  
**REPUBLIC IRON & STEEL COMPANY**  
CHICAGO, ILL.  
**PRODUCTS**

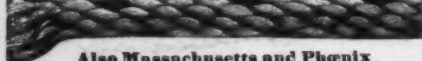
**Bristol's Patent Steel Belt Lacing.**



**SAVES**  
Time, Belts,  
Money.  
Greatest strength  
with Least Metal

Send for Circulars and Free Samples.  
**THE BRISTOL CO., Waterbury, Conn.**

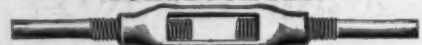
**SAMSON SPOT CORD**



Also Massachusetts and Phoenix  
Brands of Sash Cord.

**SAMSON CORDAGE WORKS, Boston, Mass.**

**TURNBUCKLES.**



Branch Office, 11 Broadway, New York.  
Cleveland City Forge and Iron Co., - Cleveland, O.



**MERRILL  
BROS.,**  
403 Kent  
Ave.,  
BROOKLYN,  
N. Y.

**MILL GINDER.**

**PILLING & CRANE,** Guard Building, Phila.  
Lewis block, Pittsburgh  
56 Pine St., New York.

**APOLLO BEST BLOOM  
GALVANIZED IRON**

The best of galvanized  
iron work is done with  
Apollo; has to be.

All had better be.

American Sheet Steel Company  
Battery Park Building  
New York

**A New U. M. C. .22 Short Smokeless Cartridge**  
**AT A REDUCED PRICE.**

**ACCURATE,  
SMOKELESS,  
CLEAN.**



**Little Noise.**  
No burning grains  
of powder from  
the rifle's muzzle.  
**Comparatively  
Cheap.**

Your Dealer has it or can get it for you.

Send for Illustrated Folder Describing the New .22 Short.

**THE UNION METALLIC CARTRIDGE CO.,**  
315 BROADWAY, N. Y. BRIDGEPORT, CONN.

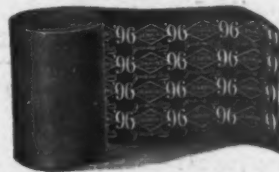
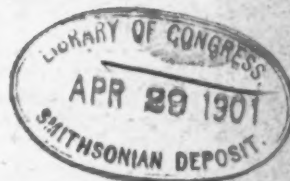
**CAHALL BOILERS** See Page 100

**CAPEWELL HORSE NAILS.**

NEW YORK,  
PHILADELPHIA,  
CHICAGO,  
ST. LOUIS,  
BOSTON,  
DETROIT,  
CINCINNATI,  
SAN FRANCISCO,  
PORTLAND, ORE.,  
BUFFALO,  
BALTIMORE,  
NEW ORLEANS.

**BRANCHES:**

**THE CAPEWELL HORSE NAIL COMPANY,**  
HARTFORD, CONN.



**Jenkins '96 Packing.**

Pronounced by steam users throughout the world  
the best joint packing manufactured. Expensive?  
Not at all, as it weighs 30% less than many other  
packings, consequently is much cheaper.

JENKINS BROTHERS, New York, Boston, Philadelphia, Chicago.

**Brass Prices High So Use Bright "Swedoh" Stamp-** see 130  
**ing Steel. Easily Brass Plated and Save Money.**



**MAGNOLIA METAL.**

Best Anti-Friction Metal for all Machinery Bearings.

Fac-Simile of Bar.  
Beware of  
Imitations.



**MAGNOLIA METAL CO.,** 266 and 267 West St.,  
Owners and Sole Manufacturers, NEW YORK.

London, Chicago, Montreal, Pittsburgh,  
Boston, San Francisco, Philadelphia.

THE  
**ANSONIA BRASS**  
AND **COPPER CO.**  
MANUFACTURERS OF  
**BRASS AND COPPER**  
Seamless Tubes, Sheets, Rods and Wire.

**Ingot Copper.**

SOLE MANUFACTURERS  
**Tobin Bronze**  
(TRADE-MARK REGISTERED.)  
Condenser, Plates, Pump Linings, Round,  
Square and Hexagon Bars, for Pump  
Piston Rods and Bolt Forgings.

99 John Street, - - New York.

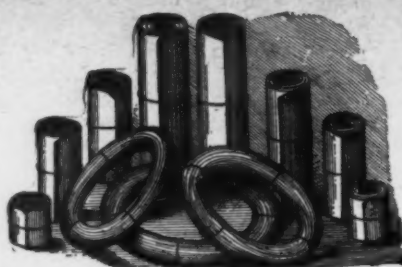
**Randolph-Clowes Co.,**

Main Office and Mill,  
**WATERBURY, CONN.**

MANUFACTURERS OF  
**SHEET BRASS & COPPER.**  
**BRAZED BRASS & COPPER**  
**TUBES.**

**SEAMLESS BRASS**  
**& COPPER TUBES**  
TO 36 IN. DIAM.

New York Office, 255 Broadway, Postal Tel-  
egraph Bldg., Room 202.  
Chicago Office, 602 Fisher Bldg.  
Boston Office, Cor. Oliver and Purchase Sts.



**Waterbury Brass Co.**

Established 1845.

**Sheet, Roll and Platers' Brass,**

German Silver, Copper, Brass and Ger-  
man Silver Wire, Brass and  
Copper Tubing.

**COPPER RIVETS AND BURS.**

**TAPE MEASURES,**  
**METALLIC EYELETS,**  
Brass Kettles, Brass Tags, Powder Flasks,  
Shot Pouches, &c.,

AND SMALL BRASS WARES OF EVERY DESCRIPTION  
*Cartridge Metal in Sheets or Shells*  
*a Specialty.*

DEPOTS:

60 Centre St., New York. 125 Eddy St., Provi-  
dence, R. I. 38 Mechanic St., Newark, N. J.

MILLS AT WATERBURY, CONN.

**Deoxidized Bronze**

Best Acid-Resisting Metal  
in the United States. . .

Send for Price.

**Bridgeport Deoxidized**  
**Bronze & Metal Co.,**  
BRIDGEPORT, CONN.

**THE PLUME & ATWOOD MFG. CO.,**

MANUFACTURERS OF

**Sheet and Roll Brass**

—AND—

**WIRE**

PRINTERS' BRASS, JEWELERS' METAL, GERMAN  
SILVER AND GILDING METAL, COPPER RIVETS  
AND BURS.

Pins, Brass Butt Hinges, Jack Chain, Kere-  
sene Burners, Lamps, Lamp  
Trimmings, &c.

20 MURRAY ST., NEW YORK.

144 HIGH ST., BOSTON.

199 LAKE ST., CHICAGO.

ROLLING MILL:  
THOMASTON, CONN.

FACTORIES:  
WATERBURY, CONN.

**SCOVILL MFG. CO.,**

Manufacturers of

**BRASS**

SHEET, WIRE, TUBES.

Hinges, Buttons, Lamp Goods,  
Nipples, Pumps and Oilers  
for Bicycles, Braziers'  
Solder.

FACTORIES, WATERBURY, CONN.

DEPOTS:

NEW YORK, CHICAGO, BOSTON.

**JOHN DAVOL & SONS,**

AGENTS FOR

Brooklyn Brass & Copper Co.,

DEALERS IN

**COPPER, TIN, SPELTER,**  
**LEAD, ANTIMONY.**

100 John Street, - New York.

**Arthur T. Rutter,**

SUCCESSOR TO

**WILLIAM S. FEARING,**

256 Broadway, New York.

*Sheet Brass, German Silver, Cop-  
per, Brass and German Silver  
Wire, Brazed and Seamless  
Brass and Copper Tubes, Small  
Tubing a Specialty. Brass and  
Copper Rods, Brass Ferrules,  
Sheet and Ingot Copper; Spelter,  
Tin, Antimony, Lead, etc.*

**"Search-Light"**

OIL and GAS

**Bicycle Lanterns.**

Send for Circulars and Electrotypes.  
**THE BRIDGEPORT BRASS CO.**  
Bridgeport, Conn.

19 Murray St., N. Y. 17 No. 7th St., Philadelphia.  
85 to 87 Pearl St., Boston.



**Matthiessen & Hegeler Zinc Co.,**

LA SALLE, ILLINOIS.

**SMELTERS OF SPELTER**

AND MANUFACTURERS OF

**SHEET ZINC AND SULPHURIC ACID.**

Special Sizes of Zinc cut to order. Rolled Battery Plates.  
Selected Plates for Etchers' and Lithographers' use.  
Selected Sheets for Paper and Card Makers' use.  
Stove and Washboard Blanks.

**ZINCS FOR LECLANCHE BATTERY.**

**BRASS FOUNDERS**  
**FINISHERS J. J. RYAN & CO.**

68-74 West Monroe St., Chicago.

Best Bronze, Babbitt Metals, Brass and Aluminum **CASTINGS**  
On Short Notice.



No better counter  
made.

4 Wheel, \$3.00

5 Wheel, \$3.25

Guaranteed.

R. A. HART, BATTLE CREEK, MICH

BUY A SEAMLESS LINENOID FOR \$25.00 AND  
Paddle Your Own Canoe.

Crane Bros., Canoe Builders, Westfield, Mass.

SEND FOR CATALOGUE.

**HENDRICKS BROTHERS**

PROPRIETORS OF THE

**Belleville Copper Rolling Mills,**

MANUFACTURERS OF

**Braziers' Bolt and Sheathing**

**COPPER,**  
**COPPER WIRE AND RIVETS.**

Importers and Dealers in

Ingot Copper, Block Tin, Spelter, Lead, Antimony, etc.  
49 CLIFF ST., NEW YORK.









# THE IRON AGE

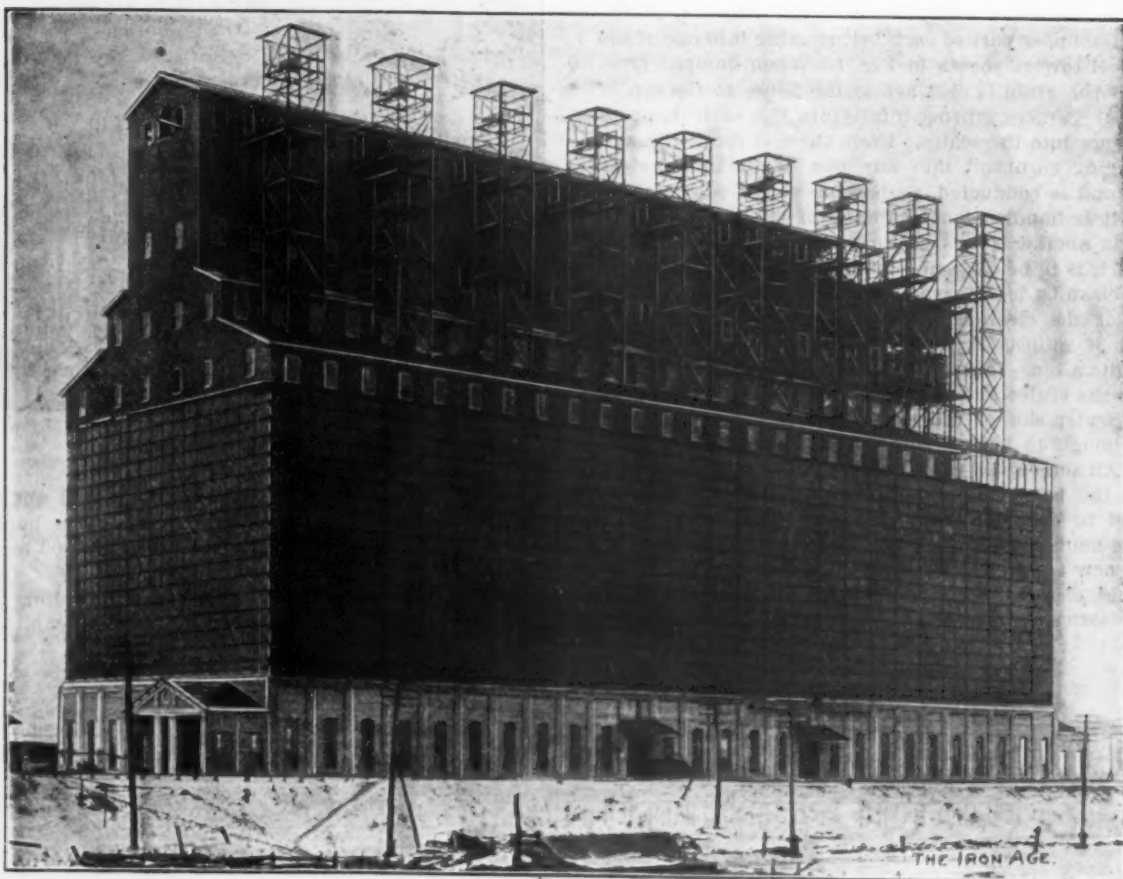
THURSDAY, APRIL 25, 1901.

## The Largest Steel Grain Elevator.

To most people an elevator is an elevator—that is, an elevator that holds grain. It is a big, massive structure that to the uninitiated means nothing but a lot of wheat inside and a splendid blaze if it catches fire. But within those dark and gloomy piles, behind those tremendous walls, there is as much difference as in any other structure, and there has been as much, or more, evolution in grain storage construction in the past few years as in anything else. Materials have changed, methods are new and sizes have increased wonderfully. What might

can scarcely be improved upon until some new and better material than steel is found, or some more daring engineers shall have persuaded capital into experiments not yet thought of. This new elevator is beginning to receive some grain, and though it will not be fully completed for some months, it is far enough along for description.

This is what is known as a terminal elevator, one that receives grain from the cars that bring it from the farms and stores it until wanted for shipment by water to its destination. As such it must have appliances for taking out the dirt contained in the grain as it comes from the threshers, for weighing and storing it, for maintain-



THE LARGEST STEEL GRAIN ELEVATOR.

have been a few years ago the most advanced construction, both in point of character of material, in labor saving appliances and in magnitude, is now far to the rear. The elevator of to-day is no longer a fire trap, it is built of metal or mineral, of steel or tile or concrete, and it is filled with all the newest machinery that the busy brain of mechanical genius has been able to devise. Instead of holding a million bushels—and for years the million-bushel elevator was the monster—it now holds two or three millions, and even more.

No individual has done more to bring about this advance in character than Jas. J. Hill, president of the Great Northern Railroad. It is fitting that this should be true, for his road is far and away the leading wheat road of the world, and brings yearly into Duluth and Minneapolis from 75,000,000 to 100,000,000 bushels of wheat alone. Mr. Hill is just completing an elevator at the head of Lake Superior that is the most advanced specimen of elevator architecture extant, and one that

ing the integrity of various grades, or brands, as they might be called, and for giving to individual shippers special bins for their own grain. It must also be fitted to weigh out to ships with the utmost exactness, to load rapidly and to carry on all its operations under the watchful eye and close scrutiny of the officials of the State, who are put in charge to care for the interests of the shipper.

In the construction of a terminal elevator, therefore, many new mechanical refinements are necessarily introduced, and mechanical contrivances must be twisted and fitted to meet the requirements of the situation. While steel elevators have been built before, they have been for storage merely, of simple design, and never containing the niceties of construction that are placed in the terminal house.

The passage of grain through an elevator is not simple by any means; it runs up and down, across and around in a way utterly confusing to the layman, who

cannot imagine why it is so carried and how it is done, if necessary. But every inch of motion is needed.

Nine grain laden freight cars can be brought into this elevator on each of two tracks at one time and simultaneously unloaded. Each train of nine cars is attached to a grip cable that runs over a sheave 96 inches in diameter, and as it enters the building the several cars, whatever their length, stand directly over long steel gratings above inverted pyramids of concrete hoppers, into which descend the belts carrying the elevating buckets. These hoppers are each 20 feet wide, to catch the grain from both tracks, and each is 34 feet long, so that the nine form almost a continuous hopper the length of the house. These are so much longer than usual in order that the cars need not be uncoupled and spotted, which would take a minute or two of time. Running on tracks attached to brackets in the walls are automatic shovels for unloading the cars, and these shovels are also arranged so that they can be spotted directly to the front of each car door. These shovels work automatically and are put in the proper location by power grips. Running to the bottom of the hoppers are endless rubber composition belts carrying a multitude of small buckets which scoop up the grain and hoist it to the very top of the house, the upper part of each belt running into one of the nine steel towers shown in Fig. 1. When dumped from the belt the grain is shot across the house to the top of the great garsers, whence it falls into the scale hoppers and thence into the scales. From these it drops through a swinging turnhead into any one of the numberless spouts and is conducted, perhaps to a belt conveyor by which it is handled longitudinally of the building, perhaps via another series of turnheads and spouts to its bin. If it is to be cleaned it falls through the bin to one of the cleaning legs that elevate it, and passes over the sieves of the cleaning machines on the ground floor, whence it returns again to the top of the house and down into a bin. If it is to be shipped it is sent a second time to the scales and thence to the great shipping bins on the water side of the house, which have a capacity large enough to load a ship of 160,000 bushels at one draft. All screenings from the cleaners are directed to a belt in the basement and there collected. All dust is gathered in collectors and ejected. That is the way wheat is handled through a terminal grain elevator.

The new steel elevator at West Superior consists of the usual elements—a storage house of bins below, a cupola above containing the elevating and trans-

ing cars, before described, the return to the stationary spout system, and the application of electricity to all machinery drives.

The great elevator is built throughout of soft open hearth steel under rigid specifications, of No. 1 tank plate, and every part is treated to one coat of boiled oil with one-tenth lampblack, all parts difficult of access having

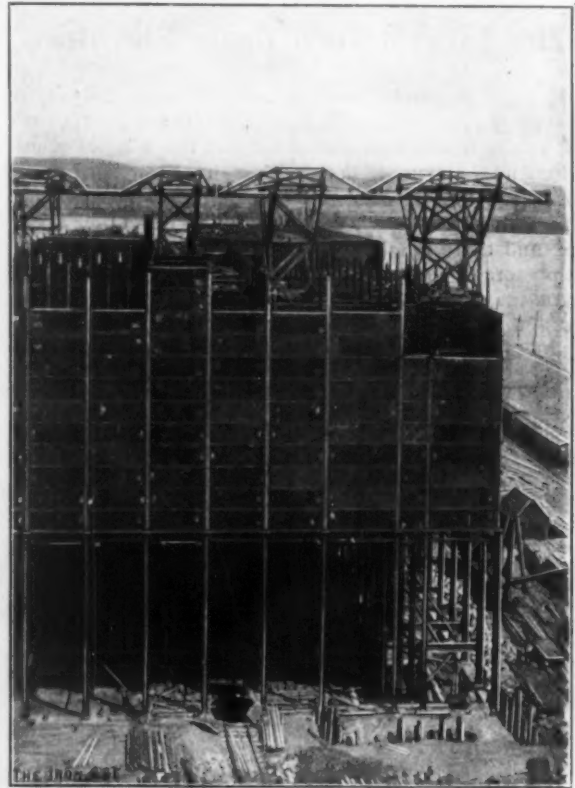


Fig. 2.—View During Construction.

two coats. There are 10,000 tons of plates and angles and 400 tons of sheet steel and small angles. The house with its contents of wheat will weigh about 104,000 tons. It is situated on the Superior side of the harbor of Duluth-Superior on a slip  $\frac{1}{4}$  mile long and affording 20 feet of water at the end of railway yards with room for

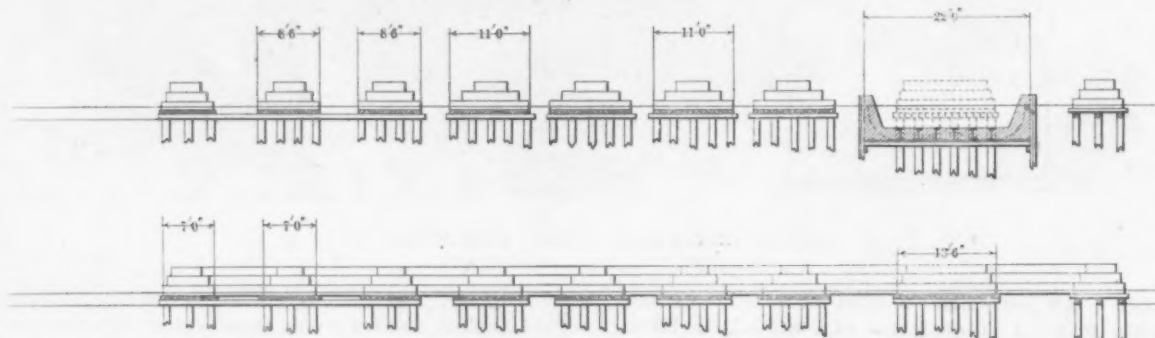


Fig. 3.—Cross Section of Piers.

#### THE LARGEST STEEL GRAIN ELEVATOR.

ferring machinery. The house has many distinctive features that mark it as different from anything yet built. Among these are its square steel bins 85 feet high, with hopper bottoms, Figs. 4 and 5, of steel plate, rectangular at top and running to a cone at the outlet underneath, the whole immense weight mounted on steel columns 40 feet above the ground; the elaboration of the transferring and hoisting apparatus and appliances; the unusual cleaning methods; the systems by which the whole house can be maintained at any operation without closing any other part; the movable shovels for unload-

ing cars. Two tracks run through the house, and at the end of the yard is a single track 80-foot transfer table feeding 12 tracks. The individual yard for this house contains 160 cars.

Commencing at the foundations, Fig. 3, the elevator is set upon 4600 piles, each 40 to 50 feet long and 14 inches through. Each was driven by water jet and heavy steam hammer to refusal. By the water jet plan one pile is set by driving the adjoining one and the ends of the piles are not "brooned." Each pile is capped by a heavy timber head bolted on. On clusters of these piles

timber grillage was set, upon which concrete pedestals of a mixture of 1 part of Portland cement to 3 of sand bound by iron rods hold the bases of the steel columns, each of which latter weighs 5 tons. Along the entire length of the structure, on the receiving side, are the concrete receiving hoppers, each surrounded by sheet piling cofferdams. The floor is of heavy cement.

Above is the main floor, 32 feet to the base of the bins

is the cleaning machinery, consisting of eight groups of machines, five to a group. These machines will scalp, grade and clean the grain at one continuous operation. For reasons that every elevator man will understand, the operation of the cleaning machines is among the most important in the entire elevator.

A veritable forest of spouts reaches down from the bottom of the bins toward the floor, for the transferring

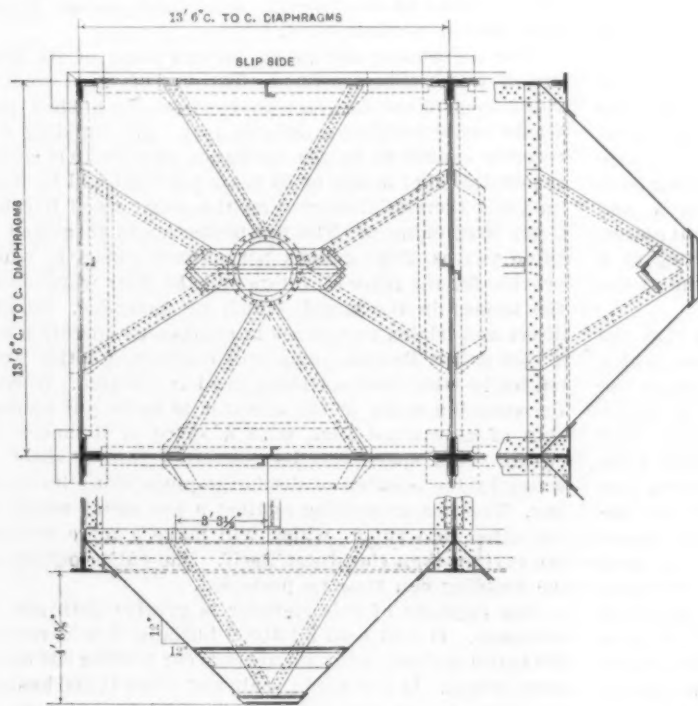


Fig. 4.

Details of Bin Bottom.

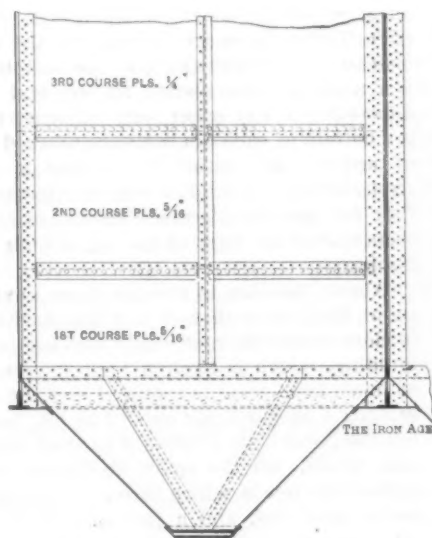


Fig. 5.

over it. On this floor are two parallel railway tracks over the receiving hoppers. These hoppers are each 35 feet long and are covered with the usual steel grating. To add to dispatch of unloading cars there are 18 large automatic shovels, each hung from a track in the side of the columns and each running freely on its own track.

of grain from one series of bins to another, from the house pockets to the shipping bins, to the cleaners or to any other part of the great house.

Rising from the main floor are the rectangular steel bins, 607 in number, varying in size from a capacity of 12,200 bushels to less than 2000 bushels. They are 85

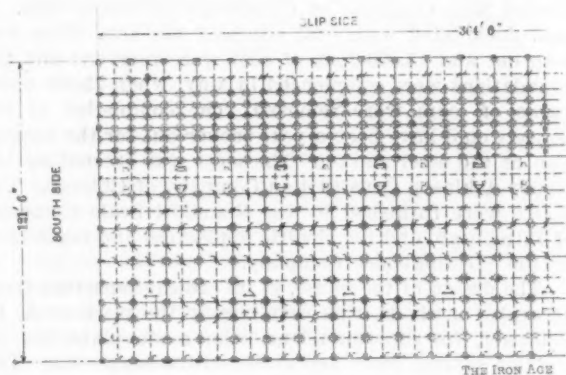


Fig. 6.—Part Bin Plan.

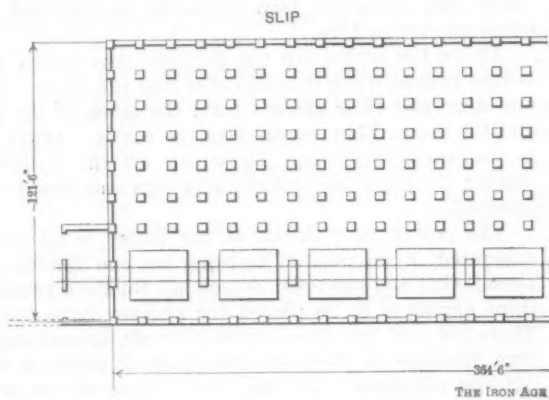


Fig. 7.—Part Foundation Plan.

#### THE LARGEST STEEL GRAIN ELEVATOR.

There is one shovel for every car that can be brought into the house at one time. An automatic grip brings a shovel readily and quickly to the door of any car and the unloading is done in remarkably rapid time, with one man to each shovel. Each line of nine shovels is hung by two sets of rope drive, and the utmost ingenuity has been shown in handling the rope through the several shovels and their various pulleys. Indeed, the shovel system and its unique elaboration is one of the many interesting features of this elevator. On the water side of this floor

feet high, higher than any elevator bin has ever been made. The steel plates forming these bins are in 17 courses of 5 feet each, and the steel of the two lower courses is 5-16 inch thick, that of the succeeding four 1/4 inch, and the remaining 11 3-16 inch. The bins vary from 16.9 x 13.5 feet to 6.75 x 4.5 feet in horizontal section. There is, of course, an immense pressure against the sides of the bins, which have not the circular form to give the strength that is relied upon in all other steel elevators ever built, so a Z bar, Fig. 6, is run up the



center of each side of each bin. These bars are connected each way by tie bars spaced 5 feet apart, one above the other, and running to the center of each plate. These tie bars are  $5\frac{1}{2} \times 7$ -16 inch and hold the plates rigidly. Each corner of each bin is reinforced from bottom to top by angles that are at bottom 8 x 8 inches, tapering to less than half that size at top. These make a solid riveted X beam up the depth of the bin in each interior corner of the great house. Alternate flanges of bin plates are bent inward to make a rim, which is in order that the grain may be deflected into an arch, thus taking off some of the weight of the mass of wheat and distributing the pressure throughout the depth of the bin instead of concentrating it at the bottom, as usual. This is a novel and interesting feature and would be almost impossible in any other form of construction. The hopper bottom of each bin is also reinforced by a strong back of angles that assist in making a lower arch and strengthen the bins. The hopper is formed of eight pieces, four flat and four pressed plates, so that starting at a rectangle at the base of the bin it ends in a cone at the discharge.

Above the bins is the bin floor, next above that the spout, then the scale and then the machinery floor, which is close under the roof. All these are in a cupola of the building, which is itself a high structure and in which so much head room is required that the problem of wind bracing was a difficult one. The bin floor contains little but the lower ends of the discharging spouts running into bins below. On the spout floor, next above it, are the lower turn heads which direct the grain from the upper series into bins, and a pair of longitudinal belts, each 40 inches wide and running the length of the elevator. They are to transfer grain lengthwise of the house and the two when running 1000 feet per minute will transfer 32,000 bushels of grain hourly. They are endless, passing over pulleys, and devices called trippers are placed in each belt for discharging the grain. By these the belt is run in the shape of a U and the grain, which drops from the lip of the U, is caught by a spout inserted in the U and delivered to one side. The belts have no cleats or holding devices of any kind and run full but do not spill. They are sustained by idlers spaced at short distances.

On the next floor above are the scales, immense balances holding bins capable of weighing 1600 bushels of wheat or 2000 bushels of oats. The upper system of turn heads is on this floor, under the scales. By an ingenious arrangement a man on either this or the floor below can place the turn heads in any desired spout reaching certain bins.

Above the scales are the garners, into which wheat is first poured when it is elevated into the house. These are large and their girders form the sides of the house and the floor. They empty into the scales. Above them is the machinery floor, on which all the motors for driving the elevating and cleaning legs and elevators are situated.

The power distribution in the house is all electric, generated in an outside building by one tandem compound Allis and one cross compound Buckeye engine. A third engine is to be placed for another large dynamo. There are now two three-phase, 440-volt, alternating current dynamos of Westinghouse make in addition to the lighting machines. All the three houses of the system are worked from this generation. In the new steel house are these motors: For the car haul into the building, one 100 horse-power; for the receiving and shipping legs, 18, 75 horse-power; for the cleaners, shovels and fans, eight 50 horse-power; for the conveyors, two 25 horse-power; for the transfer table, one 20 horse-power; for the cleaner legs and passenger elevator, ten 15 horse-power; for a conveyor, one 7.5 horse-power. In all 42 motors, of an indicated horse-power of 2107.5. There is a switchboard in the superintendent's office and each motor has its starting switch near the machine it drives.

Before this house was erected it was said by elevator builders that grain could not be hoisted 250 feet, that the bins could not be so deep, that square bins could not be used at all. Grain is hoisted in buckets attached to wide endless belts running over pulleys at top and bot-

tom. The hold is by friction, and it was claimed that the weight of a loaded belt would cause it to slip. In these things the new house is an innovation, as in those other ideas mentioned before. The 500 carloads of steel that went into this building was all punched, sheared and partially riveted at Pittsburgh, and it all went together without error of moment. There were 10,000,000 rivet holes, 2,000,000 rivets were machine driven in the shops and 1,000,000 more field driven on the ground. The 10 miles of steel spouts were made on the ground and erected without error.

The elevator is fire proof, though some of its floors are of wood, asbestos lined. The use of wood was decided upon from the fact that wheat on a steel floor would make walking a difficult feat. The building was recently examined by the insurance underwriters and it is probable that a rate of 50 cents per \$100 will be made on grain therein. The rate on the usual wood house is 2 per cent, or more. The fire protection is furnished by three pumps, 2500 gallons per minute capacity, which provide for the three elevators and the flour warehouses, the largest in the world, which lie alongside. Smaller direct and triplex pumps are in continuous operation and a 1500-gallon Buffalo pump will commence action automatically when any sprinkler head is released. Outside the steel bin walls of the elevator is to be put another skin of galvanized iron, with a space of 6 inches between. This space can be converted into a sheet of water by the opening of discharge pipes along its upper line. This water pouring against a hot metal would be converted into vapor, which will make a more efficient fire curtain than the water itself. The entire outside of the building can thus be protected.

The capacity of this elevator is greater than any in existence. It will hold 3,100,000 bushels, it will receive 500 to 600 carloads a day, an average car holding 800 bushels of wheat. It will grade, scalp and clean 12,200 bushels per hour. It can ship 300,000 bushels a day, with its 16 marine spouts, and in one draft it can pour 160,000 bushels into a waiting ship, a larger cargo than the average ship will hold. The extreme length of the house is 367.38 feet, its width is 124.33 feet, and its height is 251.5 feet. It makes a capacity in terminal house and storage at the head of the lakes for this road alone of 6,350,000 bushels. The building has been planned with machinery capacity and belt room sufficient so that additional steel tank storage can be placed alongside for 3,000,000 bushels more, all to be operated from this house. This storage room is expected to be built in the near future.

The contract for this elevator was let to the Ritter-Conley Mfg. Company of Pittsburgh in March, 1899. A coal dock filled with coal occupied the site. This was torn out and 15,000 tons of coal were removed and the foundations were commenced in May, when 23,000 cubic yards of loam were removed. The completion of the house would have been a year sooner but for the congestion of the steel market. The steel was erected by the Kelley-Atkinson Construction Company of Chicago. The scales were furnished by the Standard Scale Company of Pittsburgh, and the electric appliances and machinery by the Westinghouse Company.

The design of the house, in its radical departure from accepted methods, was very largely the work of A. D. Bellinger, its superintendent, who made plans for its erection several years ago at Mr. Hill's suggestion. The erection was carried out largely under his supervision, though by the authority of the engineering department of the road and Max Toltz, its mechanical engineer. The machinery was placed under Mr. Bellinger's direction and was largely of his design. Russell H. Folwell had direct supervision of the drafting rooms and of the plans and specifications.

D. E. W.

Joshua Rhodes, chairman of the board of the National Tube Company, Pittsburgh, has been elected president of the Consolidated Traction Company, in that city.

Silicon copper as a deoxidizer in casting copper, bronze and brass is being placed on the market by the Cowles Electric Smelting & Aluminum Company of Lockport, N. Y.

### Instructions for Shipping Steel Structures for Export.

H. G. Tyrrell of Newton, Mass., contributes to the *Engineering News* an article descriptive of a series of steel structures sold for export, with drawings of the same. He concludes his article with the following interesting instructions for shipping this class of material:

In order to estimate the probable space that this class of structural material will occupy when on board ship, it is the practice of the writer to consider all the pieces riveted up in the shop so far as possible into sections not exceeding about 8 feet in width and 30 feet in length. These are the maximum sizes that can be conveniently piled on single cars of ordinary dimensions. When similar sections are piled in this manner, one above another, to a maximum height of say 8 feet, which is the greatest that the railroads will accept, it is then a very easy matter to figure the space occupied by this material. Short pieces, or such as packages or boxes of rivets, erection tools, &c., can easily be stored in the open space between truss members. As a general thing, therefore, it is necessary to figure only the space occupied by the large riveted sections. As the charge made by the steamship companies for freight depends, not only on the space occupied in the hold of the vessel, but also on the total number of pieces to be handled and the total tonnage of the whole shipment, it is necessary also to estimate the number of such pieces and packages. In order to have this number as small as possible it is desirable to tie up small pieces in as large bundles as can be conveniently handled. These are fastened together by means of wire, this being passed through rivet holes in the iron wherever possible to avoid the danger of loose pieces falling out. All bolts and rivets should be securely boxed, those of the same size and length going in separate boxes by themselves and having the size and length plainly marked on the outside of the box. As the shipping companies do their own loading, the iron company need figure only on delivering the material on the wharf alongside the vessel.

In reference to number of pieces to be handled, it is well to be very liberal in the estimate, as otherwise a great many more will be made than were originally figured on.

The method of marking large pieces is quite similar to that employed in the case of buildings for domestic use, each separate section having its own distinguishing mark on the erection drawing. In case of very large buildings where there are a number of loose pieces with a similar mark, it is desirable to bundle these by themselves and let the mark of each piece be the mark of the whole bundle.

Before making definite arrangements for the shipping of any structural material it should be definitely arranged with the steamship company in reference to the greatest length of pieces that they will accept, as many ocean liners will not take any greater lengths than about 40 feet. Corrugated iron can be tied in bundles, keeping sheets of the same gauge and length in packages by themselves. As the cost of this material when erected in foreign countries is considerably greater than for similar buildings in America, owing to the expense of freight, it is customary to furnish galvanized iron rather than the ordinary black or painted iron. This, of course, does not occupy any greater bulk on shipboard, and will last probably twice as long as the ordinary kind.

Very much greater care is required in the preparation of erection drawings for foreign use than for domestic, as the work is usually put together in the foreign country by local labor, with the assistance of one foreman sent on from America to superintend the work, and in many cases where buildings are small it will be found economical to have the entire work put up by local parties. As can easily be seen, however, great care will be required in the preparation of the erection plan to show the exact position of every separate piece, giving the size and length of all loose bolts, rivets, and all spliced plates, filling pieces, &c.

As all the foreign countries that are importing Ameri-

can goods will have some English speaking people available for erection foreman, it will never become necessary to have the plans drawn up in any other than the English language. It will be necessary, however, to have these plans so plain that any good mechanic can understand them and erect the building according to them.

For convenience we will divide the whole cost to the purchaser into five parts, as follows: (1) Material manufactured complete at the contractors' works in America; 2, railway freight from these works to American seaboard; 3, ocean freight to the foreign country, including both loading from the wharf in America and unloading onto the wharf again at the other end; 4, railway or other transportation expense from shipboard to the building site in the foreign country; and 5, erection expense. It is the practice of American manufacturers to make their price for material delivered at vessel, giving at the same time the total number of packages or separate pieces, and the cubic capacity of all the material when stored on board. Then the buyer, who is usually in the foreign country to which the material is going, will receive from the steamship company a price for ocean freight, and he can also include the transportation expense in his own country and cost of erection by local labor, all of which are more familiar to him than they are to the American manufacturer.

### The Cosgrave Process for the Making of Compound Ingots.

Some truth, and much speculation, has been written with regard to the Cosgrave process for producing compound ingots. The manufacture of armor plate has always been in view, but it is only incidental to the tonnage expected from other industrial branches, such as vault steel, gun steel, rolls and agricultural steel. The process is not a complicated one. A core made of such material as will retain the greatest amount of heat, and of any desired thickness, is placed in a mold, fitting it perfectly. A bottom casting of either low or high carbon steel is made, and when in from 15 to 20 minutes this casting is set, after being cast, the metal has cooled where it comes in contact with the mold. At the plane of the core, however, it is still at a white heat. Then, without exposing the surface in contact with the core to the atmosphere, in order to prevent oxidization as far as possible, the core is gradually withdrawn. It is followed in its withdrawal by a second bottom casting of low or high carbon steel. As a result it will be found that the second casting remelts the surface of the first, producing much more than a weld, a certain amalgamation rather of the two castings. The product is a solid ingot showing a graduation of carbon, from one side to the other. If desired an ingot may be made showing a graduation of carbon from the center to the surface or side of the ingot. Armor plate can be thus produced, giving any uniform depth of high carbon steel required.

The first large plate made by this process will be tested shortly. As it is merely experimental, the gentlemen connected with the invention do not expect that it will reach the perfection subsequent experiments will show. Armor plate can be made for a less price, but at no such figure as has been stated. It is believed that as a result of future experiments plates will be made more rapidly and at less cost, and they will present a hardened surface of any depth. As the result, lighter plates can be used showing a ballistic test better than those being furnished now. The invention does not claim to make a new quality of steel, but it is a process for improving the various present methods.

The plate to be tested is made from the first large ingot ever cast by this process and could not be expected to do more than demonstrate the practicability of the invention. The future will demonstrate the quality of the steel to be used and the necessary depth of high carbon steel required.

It is announced that the New York, New Haven & Hartford Railroad Company will soon equip the Waterbury division of the New Haven system with electricity.



## The Bartlett-Kent Process for Rolling Seamless Pipe.

After a considerable period of experimenting on the part of W. F. Bartlett of Philadelphia, with whom has been associated E. C. Kent of the Philadelphia Roll & Machine Works, patents have been issued for a process for rolling seamless pipe.

The field for the product will naturally be large, since the want of a cheap seamless tubing is extending in many directions in modern enterprises. One important factor is the possibility of controlling the thickness of the walls within the range of  $\frac{1}{8}$  inch to  $1\frac{1}{4}$  inches. This fact insures the ability to produce pipe capable of resisting any pressure, either of air, water or steam, demanded.

The first step consists of casting hollow ingots by a special method, the accompanying engraving, Fig. 1, showing seven of these ingots, the eighth, placed on top of the others, being a forged jacket.

The rolling mill employed, which we shall describe in detail, is capable of handling a certain range of sizes. Thus the range of 16 to 20 inches, both inclusive, can be handled on one train. It is proposed to roll from 12 to

sets of heads are respectively right and left, so that the action of the ring gear is to cause all of the heads to move in the same direction as well as simultaneously. The ring gear is operated by hand or by power through the intervention of spur teeth with which the periphery of the ring gear is provided. This is very clearly shown in the photograph, Fig. 6, already referred to, the hand wheel on the top of the housing being used for that purpose. In the engravings, Figs. 2 and 3, this wheel is indicated on the left side.

One of the shafts of each roll, B, is extended, and upon it is screwed a spur gear, H, Fig. 4, which meshes with the teeth of a like gear, I, upon a shaft, K. This is journaled in bearings L L upon the outer side of a follower plate, M, fastened by bolts to the side of the housing A. One of the shafts K of each set is a continuation of, or is connected with, a driving shaft, and upon it are two bevel gears, N N, Figs. 2 and 4, which respectively mesh with similar gears, O O, on the shafts K and K. The teeth of the spur gears have such a construction that those of the gears which intermesh remain in mesh during the movement of the rolls B and B with their carrying heads.

It will be observed that by means of the shafts K and K and their gears each of the rolls of a set is geared

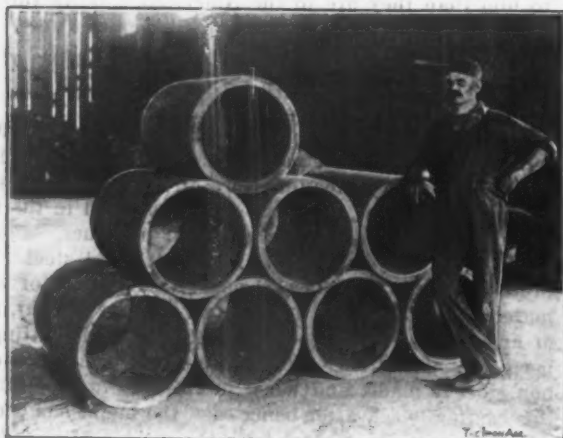


Fig. 1.—Hollow Pipe Ingots.

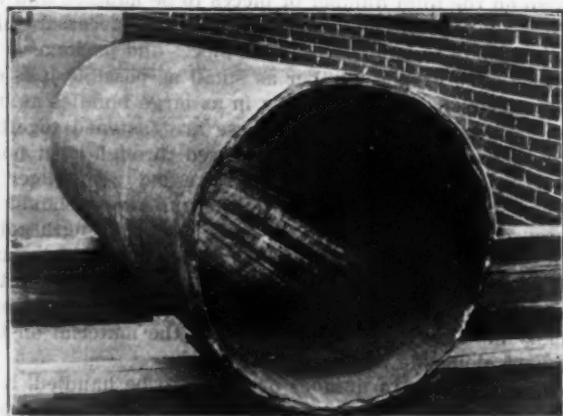


Fig. 7.—Seamless Rolled Pipe.

### THE BARTLETT-KENT PROCESS FOR ROLLING SEAMLESS PIPE.

30 inch seamless pipe, the commercial length being 16 feet.

The rolling mill consists of a housing, A, having an opening around which are grouped the rolls B, Fig. 3, which act upon the exterior of the ingot, and the internal stationary rolls P.

The rolls B and P are arranged in two sets of three, the rolls of one set being so placed that they are staggered to the other. The one set, therefore, puts work on a little over one-half of the periphery of the pipe, while the next rolls that part not previously worked. The general appearance of the mill will be clear from the reproduction, Fig. 6, of the photograph of the first one built.

Each roll B is journaled on an axis that is at right angles to a plane radial to the housing opening. It is supported in a head, C, Fig. 3, which is slidably mounted on a pair of parallel guides, D and D, Fig. 3, in the housing A. Swiveled to each head C is the inner end of a screw, E, shown in the lower part of Fig. 4, whose outer threaded portion passes through the correspondingly threaded opening of a pinion, F, Figs. 3 and 4. Located within an annular recess in the housing A at a point midway between the pinions F and F of the head moving mechanisms is a ring, G, shown in dotted lines in Fig. 3 and in section in Fig. 4. This ring has gear teeth on each side, which mesh with the teeth of the pinions F. Its important function is through the gearing to cause a simultaneous movement of the screws E, and thus force the rolls B to or from the ingot or pipe to be rolled. The threads of the screws E of the two

directly to the driving shaft, so that the objectionable construction is avoided of having to transmit the power to one roll wholly through the other. Larger and heavier gears also are possible with the employment of the shafts K and K and their gears, interposed between the driving shaft and the rolls, than is the case when the driving shaft is connected directly to one of the roll shafts and the latter are geared together. When such a construction as that just mentioned is employed the parts must be so cramped or crowded that it is impracticable within the unavoidable limitations to use gears between the shafts of sufficient size and strength to perform their work. Another important advantage resulting from this manner of driving the rolls is that all of the gears are rigidly fixed or keyed to their respective shafts, it being unnecessary to slidably mount any on account of the adjustment of the rolls. When the demands in rolling mill practice as to strength and rigidity of structure are taken into account, it will be evident that the advantages which accrue from this mode of gearing the rolls are of great moment.

The internal rolls P and P, Figs. 3 and 4, which operate on the interior of the ingot and are the anvils or supports therefor under the pressure of the outer rolls, are ellipsoidal in form, and are arranged in two sets of three, one set being arranged so that the axes of the rolls thereof are in the same vertical plane as the axes of the rolls of one of the outer sets, and a roll P of each set being placed with its axis parallel with the axis of a roll B of the outer set. The radius of the periphery of each roll P is the same as that of the interior of the



pipe to be constructed, and each roll has such angular length that the three combined form substantially a complete circle.

The rolls P and P are journaled and supported by a hollow mandrel, Q, Fig. 5, each roll being situated in an opening formed in the mandrel wall so as to project outside of said wall. The mandrel Q extends upon but one

intervals are of larger diameter at their ends than the others, to furnish ample support laterally for the ingot. This is shown in the engraving. The rolls S and S are journaled in bearings upon parallel horizontal beams, shown in Fig. 5, that extend parallel with the axis of the mandrel, and are mounted on a supporting mechanism by which they and the rolls on them can be bodily

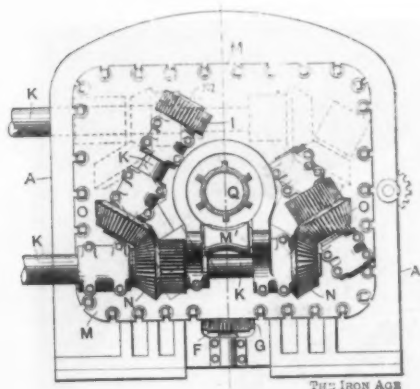


Fig. 2.—Elevation of Roll Operating Mechanism.

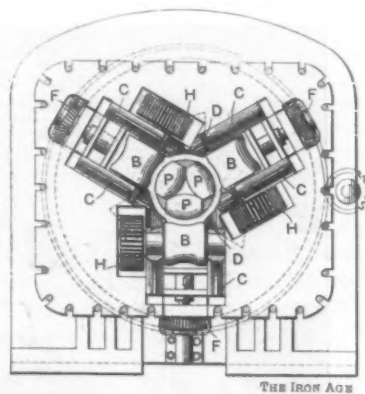


Fig. 3.—Elevation. Follower Plate Removed.

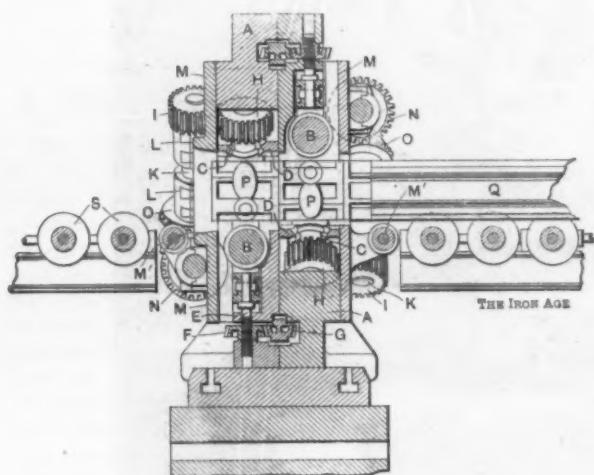


Fig. 4.—Vertical Section through Center Line Fig. 2.

raised or lowered. The mechanism consists of rock shafts operated by a motor, Y, Fig. 5, in one direction and a weight, Z, Fig. 5, in the other direction. The rollers S are positively driven.

An important mechanism is that provided at several points for turning the ingot, which is not shown in detail in the drawings. The rollers which effect this movement are brought into play by lowering the power driven feed rollers.

It will be readily understood from this description of the mill that after each pass of the ingot between the two series of rolls the outer rolls are adjusted inward to compensate for the decreased diameter of the ingot, that by the carrying rolls on the opposite sides of the housing the ingot is moved longitudinally, such rolls being adjusted vertically as found necessary, and that when required the ingot is turned on its axis by resting it upon the turning rollers. It is proposed to complete a pipe in 15 to 16 passes.

The engraving, Fig. 7, shows a pipe rolled by the Bartlett-Kent process. It is 20 inches in diameter in the

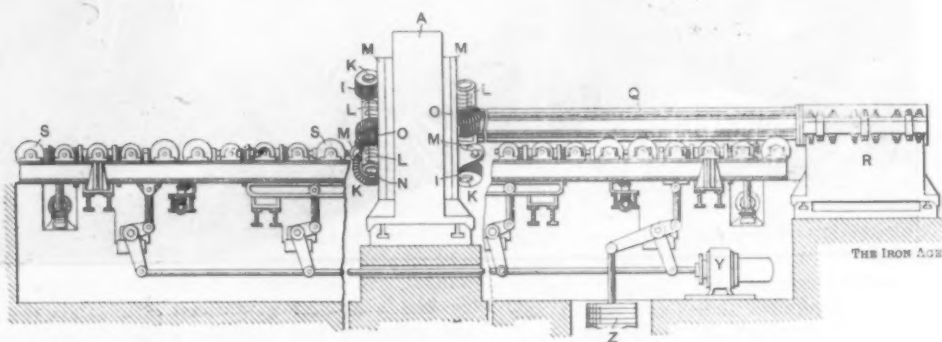


Fig. 5.—Side Elevation.

#### THE BARTLETT-KENT PROCESS FOR ROLLING SEAMLESS PIPE.

side of the housing A and is supported at its outer end by a head R, Fig. 5.

With this mill no necessity exists for positively driving or rotating the internal rolls, and therefore the rack and gear devices heretofore employed for this purpose have been discarded.

On each side of the housing A is a series of spool shaped ingot carrying rolls, S and S, Fig. 5, that have their peripheries formed longitudinally upon curved lines which correspond roughly to the curvature of the ingot to be worked. A number of these rolls at suitable

clear, has a thickness of  $\frac{5}{8}$  inch of walls and is 6 feet long.

A few years since the field for large pipe was considered limited, and nearly all large pipe for water conduits, &c., has been made of cast iron. This material, being very bulky and difficult to handle, had many disadvantages for the construction of water plants; and since higher pressure has been growing in demand to meet the wants of enlarging populations, the cast iron has become unreliable. To meet the higher pressures of the present day hydraulic engineers are demanding that

the conduits be made of steel, and many miles of riveted steel pipe are being laid at a high cost. Latterly a new difficulty has presented itself. The frequent circumferential rows of rivet heads in the interior of the pipe have served as a dam for the collection of water-slime and moss at each seam, thus gradually reducing the carrying capacity of the conduit.

The following figures show the relative cost of cast

70 per cent. more on the bulky cast iron than on the lighter steel. The seamless steel will be rolled in 16-foot lengths: cast iron is in 12-foot lengths, therefore there will be a great saving in joints in favor of the rolled steel.

An Estimate of Cost.

The following is an estimate of the cost of producing 50 tons per day of fine steel pipe:

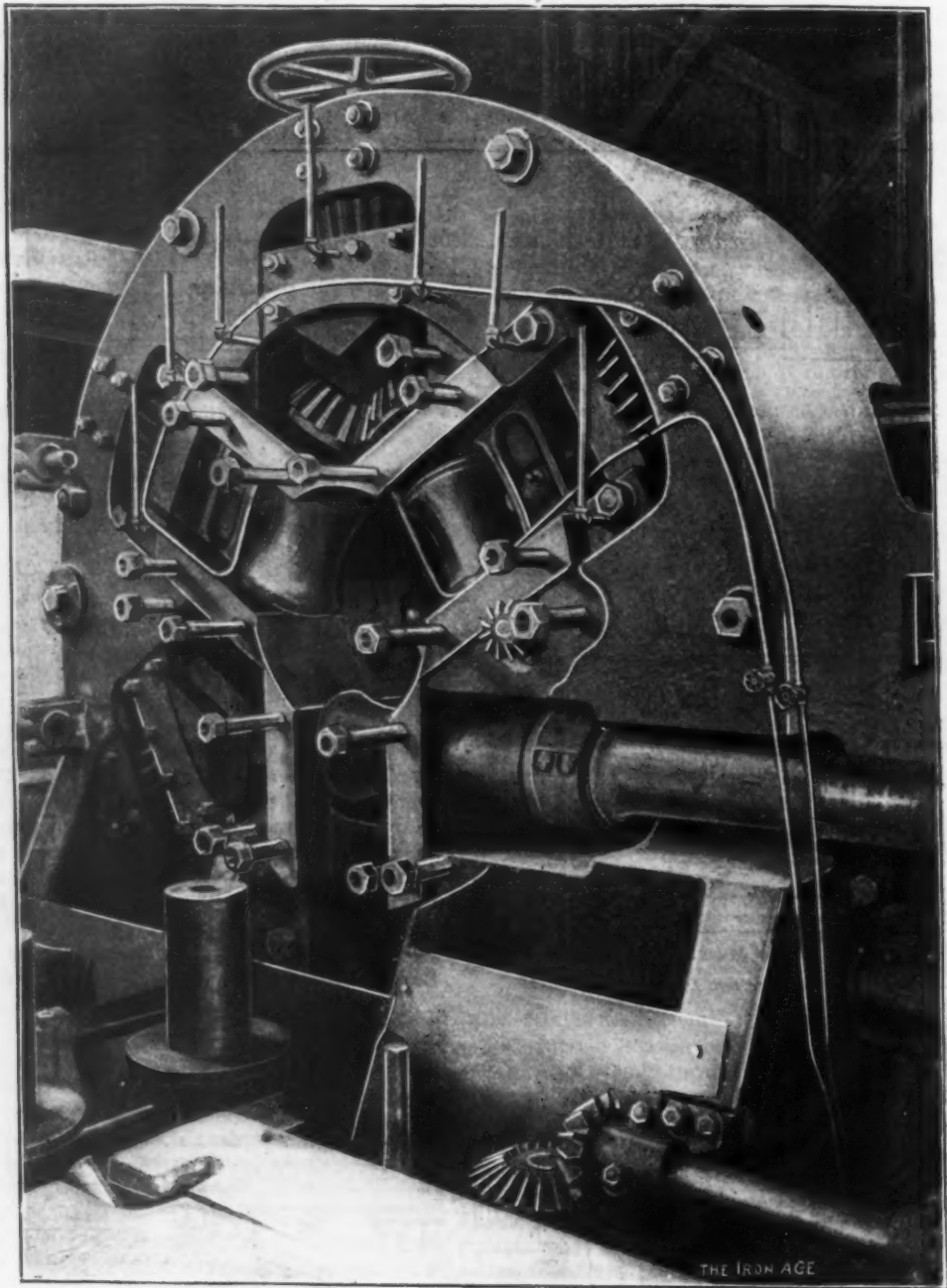


Fig. 6.

THE BARTLETT-KENT ROLLING MILL.

iron pipe, steel riveted pipe and rolled seamless steel pipe, the comparison being based on a length of 100 feet of 30-inch pipe, with pig iron at \$12.50 per ton.

	Thickness.	Weight.	Price per ton.	Total cost.
Cast iron.....	1 <sup>3</sup> / <sub>8</sub> inch	24.8	\$17	\$411.00
Riveted steel.....	½ inch	8.75	70	569.30
Rollad seamless pipe..	¾ inch	6.37	37.31	228.56

One ton of rolled steel seamless pipe will cover at least three and one-half times as many lineal feet as cast iron. Therefore, to obtain the same service from cast iron it requires 3½ tons of cast iron to 1 ton of steel, thus placing the process in competition at a cost of \$37.31 as against cast iron at \$59.50. In addition to this the consumer must pay in transportation nearly

MATERIAL.			
57½ tons iron at.....	\$12.50 per ton	\$719.00	
96 tons buckwheat coal at.....	1.25 per ton	120.00	
35 tons Westmoreland coal at..	3.15 per ton	110.25	
			<b>\$949.25</b>
LABOR IN STEEL, OPEN HEARTH BASIC.			
(Labor statement is for two shifts per day.)			
2 melters at.....	\$5.00 per day	\$10.00	
2 helpers, first, at.....	1.85 per day	3.70	
2 helpers, second, at.....	1.70 per day	3.40	
2 ladlemen, first, at.....	2.00 per day	4.00	
2 ladlemen, second, at.....	1.55 per day	3.10	
2 pitmen, first, at.....	1.65 per day	3.30	
2 pitmen, second, at.....	1.55 per day	3.10	
2 stockers, first, at.....	1.40 per day	2.80	
4 stockers, second, at.....	1.25 per day	5.00	
2 gas men, first, at.....	1.60 per day	3.20	
4 gas men, second, at.....	1.50 per day	6.00	
2 boys at.....	.60 per day	1.20	
			<b>45.80</b>

ROLLING.		
2 heaters at.....	\$4.00 per day	\$8.00
4 helpers at.....	2.00 per day	8.00
2 producer men at.....	1.50 per day	3.00
2 crane men at.....	2.00 per day	4.00
2 crane boys at.....	1.00 per day	2.00
4 table men at.....	2.00 per day	8.00
2 table engineers at.....	2.50 per day	5.00
2 feeders at.....	2.00 per day	4.00
2 rollers at.....	4.00 per day	8.00
2 engineers at.....	3.50 per day	7.00
2 first firemen at.....	2.50 per day	5.00
20 second firemen at.....	1.50 per day	30.00
FOUNDRY.		
Casting 50 tons ingots at.....	\$5.50 per ton	\$275.00
Finishing pipe at.....	10.00 per ton	500.00
Total cost seamless pipe, 50 tons, f.o.b.....		\$1,865.05
Total cost seamless steel pipe per ton.....		37.31

#### Cost of Plant.

The following is an estimate of the cost of a plant capable of producing 50 tons per day:

ROLLING MILL.	
Buildings—Main building, 70 x 200 feet.....	\$10,000
Boiler house, 40 x 200 feet.....	4,000
Roll train—1 roll train.....	25,000
Heating—1 gas furnace, complete, for first heat.....	6,000
1 gas furnace, complete, for reheating.....	10,000
2 cranes, at \$2,500 each.....	5,000
Power—3,000 horse-power reversing engine.....	30,000
3,000 horse-power boilers.....	30,000
Machine shop, &c.—Machine shop, tools and foundry.....	15,000
Sundries.....	5,000
Total.....	\$140,000

### A Great Engineering Consolidation.

The details are now being arranged preliminary to the consolidation of five important engineering establishments. These comprise the Edward P. Allis Company of Milwaukee, Fraser & Chalmers and the Gates Iron Works of Chicago, the Pennsylvania Iron Works of Philadelphia, and the Dickson Mfg. Company of Scranton, Pa. The negotiations have not yet arrived at the point of naming the proposed company into which these interests will be merged, but it is expected that the capitalization of \$25,000,000 will be required for the purpose. Rumors have for some time been current that a consolidation was contemplated of all the leading engine and pumping engine manufacturers of the country, but this was not correct. The project simply contemplates the union of interests of a few large establishments in such sections of the country and having such relations to one another that they will be able to handle home and foreign trade to advantage and secure a good working arrangement within well defined lines of manufacturing enterprise, which present great inducements.

The outcome of the proposed consolidation will be an engineering undertaking which will far surpass anything of the kind in the world. The different establishments to be consolidated are not direct competitors with one another, although they all touch or interlap one another in some of their products. The Allis Company are the greatest builders of Corliss engines in the world, and are also manufacturers of mining machinery to a considerable extent; Fraser & Chalmers are leading manufacturers of mining machinery and to a less extent are builders of heavy engines and pumping machines; the Gates Iron Works are among the most important manufacturers of mining machinery in the world; the Dickson Mfg. Company are builders of locomotives, hoisting machinery and other haulage appliances, and the Pennsylvania Iron Works are very prominent builders of heavy engines for traction purposes. The union of these establishments under one management will enable each plant to specialize its output, and in this way secure great advantages in increased product, better service to customers and lower cost.

It will be seen that this project does not contemplate anything like a monopoly in any line. It is by no means in the nature of a trust or combination of all competing interests in one line for the purpose of controlling a special branch of the trade. It is simply an aggregation of engineering talent and enterprise which is expected to bring about better conditions for the several interests

which will be consolidated. The details of the amalgamation are now being worked out, but some time will be required until everything is perfected.

#### Manufacturers' Association of Bridgeport, Conn.

With the object of securing organized action in matters of public policy affecting their interests, representatives of the leading manufacturing concerns of Bridgeport, Conn., met on April 11 at the Atlantic Hotel, in that city, and formed the Manufacturers' Association of the City of Bridgeport. The idea of organization has been in the minds of the manufacturers for some time, but its consummation was hastened by the failure of a recent attempt by a number of the manufacturing interests in the southern part of the city to secure adequate fire protection. The refusal of the Fire Commissioners to build a new engine house and establish a fire company in the district, although offered a fire engine and hose carriage with horses to draw them, as well as a lot on which to build an engine house, stirred up the manufacturing concerns, who have large holdings whose safety is at stake, to take prompt measures for the securing of proper fire and police protection.

The scope of the newly formed association will not be restricted to the municipality. When questions of transportation rates with the railroad company or the steamboat companies arise, either in the case of the entire manufacturing community or in an instance in which the interests of only one member are affected, the members of the association will present themselves as a unit. They will act in the same manner when questions of policy affecting the water, gas and electricity rates arise, also in the event of negotiations with the street railway company toward the establishment of transportation facilities for factory employees. The matter of street paving and lighting will also receive attention at the hands of the association. In the list of purposes of organization is also included the establishment of suitable places of recreation, playgrounds, gymnasiums, &c., for the benefit of the laboring classes.

The association do not propose to restrict their sphere of action to the city, but will act in harmony with similar associations throughout the State, in acting upon matters of State interest. Ultimately it is expected to secure the co-operation of such associations throughout New England, and finally all over the United States.

The charter members of the association are: The International Silver Company, the Wheeler & Wilson Mfg. Company, the American Ordnance Company, the Locomobile Company of America, the Bridgeport Brass Company, the Union Metallic Cartridge Company, the F. Armstrong Mfg. Company, the Automatic Machine Company, the Salts Textile Mfg. Company, W. H. Baker, John S. Fray & Co., R. A. Bruel, the Pacific Iron Works, the Coulter & McKenzie Machine Company, the Bullard Machine Company, the Eaton, Cole & Burnham Company, the Wilmot & Hobbs Mfg. Company, the Curtis & Curtis Company, the Bridgeport Gun Implement Company, Burns, Silver & Co., the Cornwall & Patterson Mfg. Company, the Bridgeport Machine & Motor Company, the Union Typewriter Company, the Bridgeport Forge Company, the Compressed Gas Capsule Company, the Locke Steel Belt Company, the American Graphophone Company, the Springfield Emery Wheel Company, the A. H. Nilson Machine Company, the Smith & Egge Mfg. Company, E. P. Walter and Birdsey Somers & Co.

Officers are to be elected at the next meeting, the date of which has not yet been determined.

J. B. Gibson, secretary of the Statistical Department of the Alabama Geological Survey, Birmingham, Ala., reports the mineral statistics of that State as follows: Coal, 8,504,327 short tons; coke, 1,992,561 short tons; pig iron, 1,155,583 long tons; iron ore, 3,095,406 long tons; limestone for flux, 534,061 long tons, and dolomite, for flux, 351,934 long tons.

The first United States naval coaling station to be established on foreign soil has just been completed at Pichaliqui, at the extreme end of Lower California, Mexico.



## The Prospects for Economical Automobiling.

BY M. C. KRARUP, NEW YORK.

The slump from which the automobile market in France suffered during the latter half of the year 1900 was followed by a material reduction of the selling prices at the beginning of the present year, and now the public demand for automobiles is being quickly revived in that country. Great Britain and Germany are following suit in a measure modified considerably by the lower range of prices previously prevailing in both these countries. Will something similar take place in America, notwithstanding that our prices from the beginning have been far below the schedules of Europe? And, inquiring further into the future, how long will it be before any person whose economical condition would permit the ownership of horse and vehicle may just as well contemplate the purchase of an automobile?

Commonly these questions take the more definite form: How soon will it be possible to buy a practical, reliable and useful automobile for \$500? With this price limit the question refers mainly to pleasure vehicles from the use of which no pecuniary returns are expected. With reference to business vehicles it may be put a little differently. The American business man does not like a large initial investment in a new venture. He has been accustomed to "turn his capital over" once a year in every enterprise involving risk and personal work. He wants to do the same with business motor vehicles. Spite of all computations of interest and depreciation tending to show that automobiles at their present prices and cost of operation compare favorably with the capitalized cost of horses and their keep, he will continue to consider them dearer so long as their first cost is much higher than that of the horse equipment which suffices for his work. The possible savings in operation, upkeep and time constitute his business chance. It is an uncertain factor, and reimbursement from future savings must be very sure before he will consider it a suitable compensation for a high and certain immediate disbursement. Perhaps the average business man will consider a 25 per cent. higher purchase price the limit of "what is about right." If a team of draft horses and a dray cost him \$700, he may be willing to pay \$900 for a motor dray, but ordinarily not much more.

How soon will he be able to buy it at that figure?

Probably his expectations may be met long before those others can be gratified who hope to buy a smaller power in a pleasure vehicle for about half as much money, for within the moderate dimensions available for vehicles it is not principally size that enhances first cost of machinery and wagon work, but the quality of reliability of the motor as a power producer and the refinement of its operation. Reliability once attained will be imperatively demanded for a small pleasure vehicle as well as for the dray, and refinement in operation is naturally more important in the former.

These principal factors of cost will continue to apply to all sizes of motor vehicles is nearly equal degrees until standard patterns shall have been reached and the manufacture reduced to routine processes, and the tendency must therefore be that of maintaining a certain level below which the prices for an acceptable quality in automobiles cannot descend at any given time, almost irrespective of size and the animal horse-power which the automobile is intended to supplant.

Infractions of this rule at the present stage are more apparent than real. High prices are frequently arbitrary and find little response among the buying public, while low prices, such as asked for motor cycles, represent a deliberately reduced standard of utility, a compromise between economy and vehicle qualities. Purchasers of motor cycles are supposed to "put up with" crudities in construction, design and operation that could not be tolerated in vehicles intended for something more substantial than sportive play. There is nothing derogatory to motor cycles in acknowledging their limitations.

They occupy an essentially new field, most nearly comparable to that of the road and track sulky, and it remains to be seen if this field will be cultivated after means shall have been found for removing the shortcomings in automobile vehicles which in the motor cycle are now more or less frankly accepted in consideration of the low price.

The lack of a commonly accepted standard of automobile quality or fitness explains other deviations from that level—about \$1500—at which the highest automobile quality of the day is obtainable in combination with vehicle qualities corresponding to those of a buggy or "spring wagon." Above this level should ordinarily be found the comforts and style of a fine carriage. Below it there is usually a sacrifice of vehicle convenience as well as of motor quality or traveling radius.

One feature in the automobile market seems at first to support the hope of cheap gasoline vehicles. It consists in the manufacture and offering for sale of vehicles complete with pneumatic wheels, steering gear, differential gear and driving pinion, for \$200 or less. That is to say, the motor is omitted; also the transmission mechanism. But the supposition is that any good mechanic with an ambition for constructing and owning an automobile can fit the motor of his choice, steam or gasoline, at an expense of \$200 for a gasoline motor and \$400 for a steam engine, boiler, &c.

There is the cheap automobile. But it is the part of wisdom when the makers of these running gears and wagon boxes refuse to shoulder the responsibility of fitting a motor in their product and by this omission escape all blame for the shortcomings of the automobile-to-be. In this form of business it is taken for granted that, 1, a satisfactory motor and power transmission gear can be procured; and, 2, that the problems of a running gear and vehicle body suitable for any motor and transmission gear have been solved. Both assumptions are of course radically faulty. If they were not so, the ideal motor vehicle would already be among us. The best that may be said for a motor vehicle built according to this system is that it may not turn out much worse than more expensive automobiles bought in the open market, and that it may be adapted for the first experiments of inventors who have new motors to try.

### Economy in First Cost.

From the public's viewpoint the question of economy in first cost is a different one and implies that the complete vehicle shall be known in advance to operate satisfactorily and to be possessed of a reasonable degree of durability. Apart from these requirements, economy has no sensible meaning. With any of the essential conveniences left out which constitute the reasons for using horse and carriage instead of a bicycle, for example, economy takes on a very much restricted meaning, and this applies to motor cycles, to any automobile without baggage carrying capacity, to any automobile requiring special technical education in the operator or caretaker, and to electric vehicles of very limited traveling radius. These are all new commodities, comparable to nothing that has previously existed. They do a new class of work, each of them, by new means, and the idea of economy as here considered, being relative and only intelligible in comparison with earlier methods of doing the same work, is inapplicable. Their economical worth must be judged by new standards drawn directly from a consideration of the special class of work for which they are fitted.

In order to have a clear case the economy of the automobile must be looked upon solely with reference to such automobiles as are intended and adapted to take the place of a horse and vehicle equipment in all respects. Whether other self propelled vehicles are worth the money asked for them each individual must decide according to his needs, his fancy and his knowledge of what the vehicle will do. If he has had a saddle horse and wants a change, a bicycle is the nearest substitute. It can be obtained at from \$25 to \$75, and costs practically nothing to keep, but it is impracticable on muddy roads and under certain other conditions. A motor cycle is still more impracticable on muddy roads, but it will

go much further and faster than either bicycle or saddle horse on good dry roads. It can easily be arranged to take an extra passenger. It supplies at present a somewhat troublesome and decidedly disagreeable form of locomotion. What this *ensemble* of attributes is worth is an individual question. Comparisons are idle. The cost—\$400 to \$600—may be low for a fancier and prohibitory for one who wants to cart goods to market. The convenient little electric runabout of recent production, of which the battery weighs less than 200 pounds and may be easily handled, may be excellent and well worth \$500 for taking a man to his office or a woman to the shopping district and back, but it is worthless for many other kinds of work for which a horse and vehicle could be used.

It is the full fledged automobile which is of prime interest. Automobilmism will stand or fall with it, economically and otherwise. When perfected its perfection will be the standard from which no downward deviation will be tolerated in any other class of mechanical vehicle. Its speed, now its chief recommendation, will be a mere incident, to be arranged to suit purchasers—a mere matter of power, gearing and strength of material, involving no special engineering difficulties.

In gathering data for forecasting the future price of the full fledged automobile, one is first astonished at discovering that there are no full fledged automobiles at present except delivery wagons, electric cabs and carriages, a few drays and here and there a gasoline vehicle with the motor mechanism suspended between the axles under the wagon box. In all others the ordinary vehicle conveniences for carrying goods in addition to passengers have been sacrificed to the necessity of carrying the power source and to the desire for imitating the horse vehicle's outward appearance. They are mere locomotion machines, but not vehicles in the sense of supplying adequate means for carrying, say, 1000 pounds of baggage if required, as does the ordinary spring wagon.

To remedy this defect is likely to mean additional cost of construction. In the case of some of the electric pleasure carriages the conveniences are equal or superior to those of ordinary carriages of corresponding types—victorias, broughams, hansom—but with such an addition of weight, causing tire troubles and high operating cost, that the remedy is less acceptable than the defect. The solution adopted in a few makes of gasoline vehicles of hanging the motor mechanism under the wagon box has few advocates, being unsightly and bunglesome for caretaking, cleaning and repairing. But progress seems open in this direction, though on new lines. For light steam pleasure vehicles no remedy worth the name has been discovered. The shortcoming may be considered trifling so long as there are other shortcomings apparently calling for more engineering skill, which must also be removed, but in the competition with horse traction from an economical viewpoint it is not trifling but fatal, and no remedy is in sight short of a radical redesigning of every automobile intended to be more than a toy. Specialties such as physicians' automobiles, solely and exclusively meant for transporting one or two persons, may perhaps be excepted. These represent the cheapest possible construction of an automobile, and this construction being the one now generally adopted, an increase in cost may be looked for when the defect here referred to shall have been removed.

#### **The Experience with Bicycles Delusive.**

The popular hope for cheap automobiles rests mostly on the experience with bicycles. On the other hand, sewing machines and typewriters may be cited as commodities in which cheapness is following only very slowly upon extensive manufacture and large competition. If, however, automobiles are to be cheapened it must be through the standardization of certain types of automobiles and the security for large investments in manufacturing plants which such standardization of types will engender. Until the lines of design and construction shall have become fixed and accepted it is reasonably sure that large capital will shrink from the manufacture, especially with the examples before it which the industry affords now of large but apparently prema-

ture and unprofitable investments made with the purpose of rushing the manufacture of heavy electric vehicles and light steam vehicles. Yet until capital is freely supplied to organize automobile manufacture economically no great reduction of selling price is to be expected if a margin over the cost of production is to be reckoned with.

While there can be no reasonable doubt that the production of any highly successful type of automobile—and the success well tested out by the public—will be followed by manufacture on a gigantic scale, it is not by any means certain that this will mean a price reduction to the buyer in less than 20 years after the inception of such manufacture. It will beyond all doubt mean a lessening of the cost of production, but it will depend largely on breadth and validity of patents whether the public will receive the benefit.

In this respect the competition with horse traction is perhaps the only feature which may be relied upon to brighten the horizon and prevent a repetition with automobiles of the scandalous extortions which have been practiced in this country with relation to telephone and telegraph service.

#### **An Increase in Automobile Prices.**

Most other data point rather to an increase of automobile prices than the reverse. Among such data are the following:

The price of steam pleasure vehicles is now considerably higher than when the light steam vehicle was first put on the market, it having been found necessary to make the construction more substantial. Owing to the absence of basic patents in steam engine construction and the comparative economy in operation of the larger sizes of engines, there seems, however, to be the best chance that steam automobiles for heavy hauling—sufficiently heavy to warrant the employment of an engineer—will reach an economical basis at an early date. Steam pleasure vehicles will probably hover over the average figure of \$1500, where they practically are today, for some length of time, until gasoline vehicles become so perfected that the much lower cost of operating them—not much more than one to five as compared with steam—begins to depress the price of steam pleasure vehicles, and perhaps forces them out of the market.

The electric storage battery vehicle is intrinsically the cheapest of all to manufacture. The cost of raw material plus the cost of labor figures up lower than for any other automobile. When the patents on storage batteries expire, in a few years, it will be quite possible to make and sell an electric vehicle of the kind now in use and selling for \$1000 for, say, \$600 or less, but improved batteries have already been patented which promise less weight and greater traveling capacity, interchangeably. Other more radical improvements are, while not probable, by no means inconceivable. Nothing relating to new means for generating or storing electric energy may be pronounced impossible. But whatever progress will be made is likely to be patented and will, if radical enough to compete with the gasoline motor for general vehicle purposes, render the present form of electric vehicle hopelessly antiquated.

#### **The Hydrocarbon Motor.**

The mainstay of all hopes for cheap automobiles is the hydrocarbon motor, with kerosene, gasoline, alcohol or acetylene as fuel. Almost any of the existing models of gasoline motors might be produced in quantities at a cost of less than \$100 for a single cylinder 5 horsepower engine, the material in the rough being worth about \$40. Not one of the double, triple or quadruple cylinder motors used in automobiles would necessarily cost more than \$200 if produced by economical repetition methods. But not one of them is so near perfection that it may even be thought of as approaching finality. The "overhead" expenses in their production are enormous, unless an artificial halt has been made in progressive construction for purely commercial reasons.

About 50 American manufacturers produce somewhat similar motors for use in boats and thousands of gasoline motors are more or less successfully employed



to drive machine tools in factories and dynamos in electric light plants. These motors are sold at good profits and yet at prices that do not seem high, but any argument drawn from this condition in favor of cheap gasoline vehicles—of satisfactory construction—would be sadly at fault.

#### Difficulties Involved.

The hydrocarbon or internal combustion motor is generally known to be the most economical power available and the simplest in construction. Unfortunately, however, this power is by its explosive nature as poorly adapted for the work of driving a vehicle as imaginable, especially where crude roads prevail. To make it available even for unvarying work it is necessary to store it first in the rotary energy of a heavy fly wheel and then to take the power wanted from the shaft of the latter. This works very well when the power is uniform or of necessity proportionate to the power developed, as that of turning a propeller wheel in water. Still, when the fly wheel is heavy enough to absorb the spasmodic power impulses it does not respond promptly to variations in either the work or the power. It takes some time before an adjustment to slow down the motor can take effect. This would be bad for boats and fatal for automobiles. For this reason alone heavy fly wheels cannot be used in boats and automobiles, but their size and weight would also prohibit their use. If, on the other hand, the fly wheel is small, its stored energy easily becomes insufficient for the work in hand and the force of each explosion takes effect directly in the work, rendering it highly disagreeable for anybody exposed to the jarring.

If the public would accept a form of transportation in which constant shaking of the vehicle is the unavoidable accompaniment of crude construction, there would be no reason why gasoline automobiles should not be sold very cheaply. But the public, in sober reflection, will do no such thing, as long as there are horses, steam and electricity. The majority still believe in the testimony of their senses and cannot long remain persuaded that jarring is pleasant and the odor of partly burned gases a delight.

The cost of gasoline vehicles of the highest quality which the present stage of the art affords is mainly that incurred in making a hundred and one more or less efficacious provisions for minimizing, subduing, smothering and absorbing the evil effects of an explosive power by heavy material, fine workmanship, multicylinder high speed motors, ingenious transmission gears, balancing of rotary parts, &c., and the problems involved are so many sided and difficult that the progress made so far looks like a drop in the bucket from the standpoint of a perfectly unbiased spectator.

If the progress were really satisfactory and conclusive evidence of ultimate complete success, steam vehicles could no more be thought of as in the race, and electric vehicles would be at once abandoned to await some revolutionary invention in applied electric.

The crude gasoline vehicle is cheap, or ought to be cheap—\$500—now. The acceptable gasoline vehicle is not yet made, and the creations which come nearest to the ideal conception of the striving engineer are expensive to make, expensive to sell and none too easy to handle. And yet they are the standard bearers of automobilism. Furthermore, they are growing more complicated rather than less so. Refinement spells complication in the gasoline engine as it did in the formative period of the steam engine. Promising improvements are snapped up by large concerns. The possibilities of unpatentable features have been nearly, if not quite, exhausted. The vista of needed improvements presents a deep and interesting but hazy perspective. Automobilism is yet in its infancy.

Cheapness combined with efficiency is not an immediate prospect, but there is compensation in the thought that when cheapness arrives "to stay," it will come in company with all other good and desirable qualities.

In this thesis several apparent contradictions in a brief and brash analysis of a vast subject may be found harmoniously resolved.

#### Die Grinder.

This tool is designed for the grinding and finishing of flat surfaces, such as blanking, piercing and stamp dies, punches, rivet machine tools and similar work, including the great range of work for which the ordinary grinder is adapted. For the grinding of punches a holder is furnished to receive the shank; in this manner such work is as easy as grinding a flat die. The table is hinged to a bracket at one end, with a screw under the opposite end, by which a fine adjustment can be obtained. The bracket has a vertical adjustment of 14 inches, is counterbalanced by a weight inside of the pedestal, can be raised and lowered very quickly, and can be securely fastened to the column by the movement of a cam lever. An arm is provided to swing from one wheel to the other, to act as a tool rest or for the purpose of truing up the wheels. The spindle, which is of steel, runs in antifriction metal bearings arranged for taking up all wear, and carries a wheel at each end. A wheel 10 inches in diameter, with  $\frac{3}{4}$ -inch face, is best adapted to this grinder. A disk attachment is also



DIE GRINDER.

furnished for the opposite end of the spindle. The manufacturers are Dellvouk & George, 141 South Clinton street, Chicago.

#### The Bessemer Steel Industry in the United Kingdom.

The returns of the British Iron Trade Association show the following production of Bessemer steel ingots:

##### Production of Bessemer Steel Ingots in United Kingdom.

	1899. Tons.	1900. Tons.
South Wales.....	528,135	439,791
Cleveland .....	351,127	332,499
Sheffield and Leeds.....	329,896	328,934
West Cumberland.....	253,490	327,450
Lancashire and Cheshire.....	214,119	174,680
Scotland, Staffordshire, &c.....	148,317	141,650

Totals.....	1,825,074	1,745,004
Basic Bessemer steel, included in above..	517,378	491,101

The quantities of the chief descriptions of finished Bessemer steel, of which particulars have been returned to the association in 1900, were as under:

	1900. Tons.	1899. Tons.
Rails .....	759,814	838,148
Plates and angles.....	96,108	158,878
Sleepers .....	27,291	85,743
Blooms and billets.....	280,220	355,335
Bars .....	221,795	214,951
Totals.....	1,385,228	1,604,055

As we understand it, these figures are complete for steel rails, but not for the lines of products enumerated.

The Creusot Company, the well-known French gun making concern, who are now building a plant near Champagne, France, propose to erect a large works near Laroche.



## Industrial Crisis in Scotland.

### Labor Troubles Actual and Prospective.

GLASGOW, April 11, 1901.—Since my last letter we have had quite a sharp industrial crisis here, and it would be rash to say that we have seen the end of it. I fear we are only at the beginning of a long series of labor troubles. The crisis arose in connection with the demand of the colliery enginemmen to have their working day reduced from twelve to eight hours, although without reduction of wages. Everybody seems agreed that 12 hours is too long a period to keep a man on the strain at the pit head, even though his actual labor be not arduous; but to most people it seemed rather a large order that these men should expect the same pay for one-third less time than they have been accustomed to give to their jobs. The colliery owners, fairly enough—though rather dilatorily—met the situation by offering to reduce working shift to ten hours and to continue the same pay as they have been giving for 12 hours. But the engineers had been exciting each other so much in successive palavers that they "saw red," and rather than abate their own demands they went on strike at the beginning of last week. Nobody paid much attention to this at first, knowing that, if anything, there is rather an over supply of working engineers in the world quite capable of taking charge of a colliery winding engine. But the moving spirits of the Miners' Trade Union (of which the engineers are not members, having a union of their own) thought this would be an excellent opportunity to frustrate any intention the coalmasters may have of proposing another reduction of miners' wages at the end of April, when the existing wage agreement terminates. They thought that if they could keep the engine men out for two or three weeks they would stop the pits and make such a scarcity of coal that prices would run away up again to famine rates, and coal owners would not have the courage even to mention wages. So the miners were instructed to refuse to go down the pits unless men whom they knew and trusted were in charge of the engines. This was not technically a strike of colliers, though it was actually a strike "on sympathy" with another trade union. But the action of the colliers deceived nobody. Their intention was obvious, the disinterestedness of their sympathy with the enginemmen was not believed in, and they did not succeed in "saving face" either with their employers or the public. The Lanarkshire collieries were brought to a dead stop, and the coal owners of other districts began to quote up, thinking that the large industrial consumers would have to go afield for fuel. They were disappointed, for iron smelters at once began to damp out their furnaces and iron and steel manufacturers to shut down machinery as their stocks of coal ran out. Not one of them attempted to buy coal, and by the end of the week the iron and steel works were silent. Thus the colliers were defeated and went back to the pits sadder, and, let us hope, wiser, men, and engine keepers accepted the offer of their employers and went quietly back to the engine rooms.

But a week's production of coal has been lost, 21 blast furnaces were damped out and are still out, finished iron making has been stopped for a week, and in some of the steel works operations have even yet not been resumed, for reasons relative to the trade as well as to coal. Both the smelters and the steel makers are unwilling to re-start until the future is more assured. The smelters think there is no use in relighting furnaces if they are to be blown out again at the end of the month. For then, it is believed, will begin a struggle with the colliers themselves on the subject of wages. The coalmasters have not raised the question yet, but they are to meet next week to consider the whole situation. That consideration will cover also the five day policy, to which reference has already been made. The coalmasters of Fifeshire at the very outset denounced the policy as fatal to the Fife export trade, and refused to engage men except on the old terms of eleven days a fortnight, and the Fife colliers had the sense to give way. None of the Western coalmasters

did anything while the enginemmen's dispute was in progress, but this week the Ayrshire masters have posted notices at all their pits warning the miners if they do not continue to work 12 days per fortnight, which has been the rule hitherto in Ayrshire, they will all be locked out. The Lanarkshire coalmasters have not yet spoken, and are believed to be comparatively indifferent to the matter, but all in the Federation will have to adopt the same course. It is expected, then, that the Federated Coalmasters will shortly issue notice of a reduction of wages to come into effect after May 1, such wages being applicable to not less than an eleven day fortnight. The Miners' Federation will, of course, resist. Then there will be discussions and conferences, ending in a strike or lockout. Resistance on the part of the Scotch colliers will be encouraged by the English Miners' Federation, which will benefit by a strike in Scotland, but the English Federation also will have to "face the music" ere long.

### The Iron Industry.

We are then approaching a very anxious and critical parting of the ways in the iron and steel trades. And, aside from the coal question, employers in these trades have also their own labor difficulty. In what is called here the malleable iron trade wages are adjusted on a sort of sliding scale to the average selling price, which is ascertained by an auditor every two months. But there is no such system among either blast furnacemen or steel workers, and in steel industries wages are disproportionately high. Some steel makers said, when closing down last week in consequence of the action of the colliers, that they would not reopen till they came to a new understanding with their own men. So we have troubles pending in other than the coal trade.

### Shipbuilding.

And by the bye, though not perhaps in the immediate future, there will be a general scaling down in the shipbuilding and engineering wages, with attendant possibilities that one does not care at present to forecast. The local dispute in the Fairfield Company's shipyard has been conducted without heat and at present writing seems nearing an end. There has been a meeting between the chief executive officials of the company and representatives of the men, at which difficulties were smoothed over, and the way prepared for an amicable arrangement.

Work among the shipbuilders is not increasing, and though a few orders have been booked this month, the total is short of the work that is being completed. The reduction in ship plates has not brought out buyers, who think there is plenty of room in other material and in wages for further reduction in the cost of new ships. And then the termination of the war in South Africa will set free again a number of vessels to compete in the already depressed freight markets.

About the end of this month John Brown & Co., Limited, Clydebank, will put into the water an "intermediate" boat of between 11,000 and 12,000 tons for the International Navigation Company. This is not a replica of the "Vaterland" and "Zeeland," recently built by the same firm for the Antwerp and New York service of the International Company, but one of a pair being built at Clydebank to another specification for Southampton and New York service. They will be remarkably fine and very comfortable boats, though neither so swift as the "Oceanic" nor so huge as the new giant "Celtic," just launched on the other side of the Irish Channel for the White Star Line. All the White Stars have been built at Belfast, just as all the Cunards and P. & O.'s have been built on the Clyde. I do not know how many American plates may be in those Clydebank vessels for the American owners, but no American plates are coming in now, and one begins to hear calculations with regard to the possibility of resuming shipments of Scotch pig iron to the United States. Such are the vicissitudes of trade! D. T.

The American Bridge Company will make quite an elaborate building exhibit at the Pan-American Exposition, furnishing two buildings each about 60 feet in

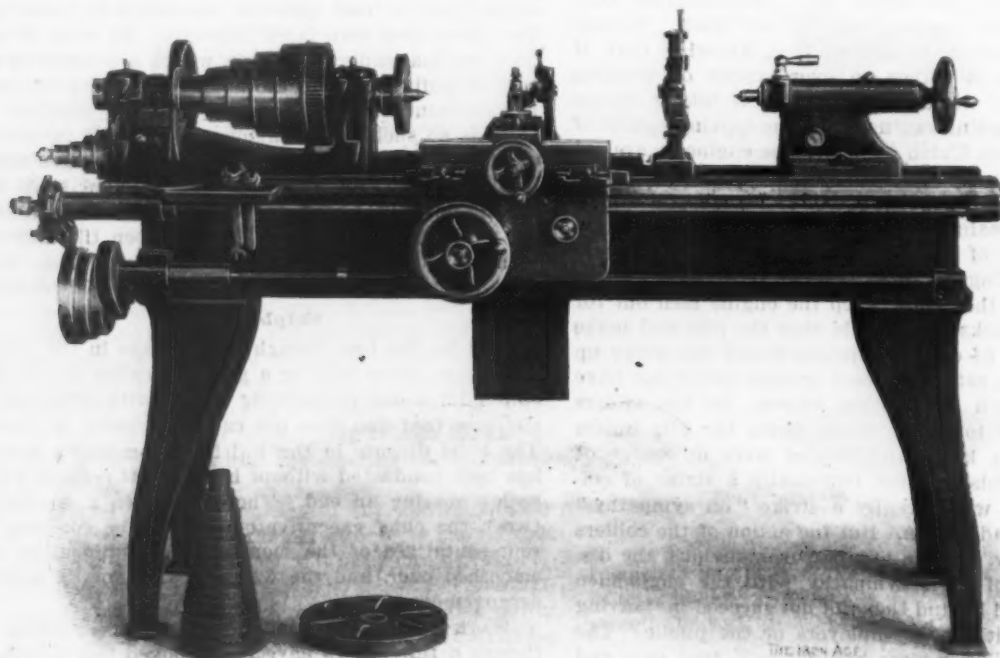
width, about 150 feet in length. One of the buildings will be of extremely plain construction, being designed for use as a manufacturing plant. The second, however, will be of ornamental design, such as would naturally be used for freight depots, street car barns and that class of structures. The American Bridge Company will also make an extensive exhibit of parts of large bridges.

### The Pratt & Whitney Weighted Engine Lathe.

The 13-inch weighted engine lathe designed by the Pratt & Whitney Company of Hartford, Conn., embodies all those features necessary to make it a convenient and rigid tool. The bed is of ample depth and width for resisting bending and torsional strains. The head is held by bolts screwed directly into the bed. The spindle bearings are large and of babbitt cast solid in the head, then compressed, bored and scraped to a precise fit. The spindle is of steel, accurately ground. The foot block, which is cut away, has long bearings on the ways, is clamped to the bed by an eccentric, and is pro-

vided with a set over for taper work and a suitable clamp for the spindle. 127 teeth, from 3 to 22, including  $11\frac{1}{2}$ ; number of grades on spindle cone, 5; diameter of largest grade,  $8\frac{1}{4}$  inches; width of belt, 2 inches; dimensions of head spindle front bearing,  $2 \times 3\frac{1}{2}$  inches; diameter of hole through spindle, 0.8 inch; ratio of gearing, 8.4 to 1; revolutions of countershaft per minute, 140.

**A New Bascule Bridge.**—The Hall Bascule Bridge Company, with temporary offices at 1322 Unity Building, Chicago, own and control patents for a new type of bascule bridge. The principal point covered by their patent is that the operation for opening the bridge is based on two curved tracks, one of these supporting the bridge at the top of the line, and the other serving to act as a counterpoise at the heel of the bridge, thus allowing a very material reduction in the amount of counterweight usually required for bascule bridges. The combination of the two curved tracks permits a greater clear waterway between abutments, without the necessity of an outstanding pier. The time required for the erection of such a bridge is much less than that



THE PRATT & WHITNEY WEIGHTED ENGINE LATHE.

vided with a set over for taper work and a suitable clamp for the spindle.

The carriage, which may be clamped to the bed for cross feed work, has long self oiling bearings on the ways, is gibbed front and rear, and is provided with raise and fall weighted rest which is gibbed in front to the carriage. The carriage has both screw and rod feed, the rod is belt driven and will knock off automatically while feeding toward the head. The slide screw is protected from chips and has micrometer dial.

Either an English or metric lead screw can be furnished, and both English and metric threads can be cut with each screw. The bar of the taper attachment is graduated and has an adjusting screw, and is constructed with only one working joint, and this is provided with a taper gib to take up wear, so that all lost motion is avoided.

The principal dimensions are: Swing over bed, 13 $\frac{3}{4}$  inches; swing over carriage, 6 $\frac{1}{4}$  inches; length of bed, 5, 6, 7 and 8 inches; greatest distance between centers of shortest bed, 21 inches; will cut threads per inch with English lead screw from 3 to 92, including  $11\frac{1}{2}$ ; will cut standard metric threads with English lead screw and extra gears, 85 teeth and 127 teeth, from 12 mm. to 0.5 mm. pitch, including 0.9 and 0.75 mm. pitch; will cut standard metric threads with metric lead screw from 12 mm. to 0.5 mm. pitch, including 0.9 and 0.75 mm. pitch; will cut threads per inch with metric lead screw and extra gear

required for ordinary bascule bridges, and it is claimed that the cost of a Hall bridge is very much less than that of an ordinary one. A model of the Hall bascule bridge can be seen at the offices of the Chicago Drainage Canal Trustees, 1037 Security Building, Chicago.

**The Molders' Wages.**—A press dispatch from Milwaukee, Wis., states that the union iron molders, as well as the machinists, propose to demand an increase in wages on May 1. Members of the union say that they will ask for the same increase that the machinists have already demanded—namely, 12 $\frac{1}{2}$  per cent.

Under date of April 16, 1901, the Treasury Department has decided that on the exportation of Babbitt metal manufactured by Merchant & Co., Incorporated, of Philadelphia, Pa., in the manufacture of which is used lead paying a duty of 2 $\frac{1}{2}$  cents per pound, antimony dutiable at  $\frac{3}{4}$  cents per pound, and the tin and cadmium free, a drawback will be allowed equal in amount to the duties paid on the lead and antimony, less the legal deduction of 1 per cent. In the liquidation of the drawback entry, the quantity of lead and antimony which may be taken as the basis for the allowance of drawback shall not exceed 79 pounds of the lead and 16 pounds of antimony in each 100 pounds of the exported article.



## The Russian Tariff Trouble.

WASHINGTON, D. C., April 23, 1901.—The Treasury Department has received the full text of the majority and dissenting opinions of the Board of General Appraisers on the Russian sugar test case and has already begun the preparation of memoranda for the guidance of the district attorney in defense of the appeal to the United States Circuit Court, which it is assumed the sugar importers will take within the 30 days' limit allowed by law. The decision being in favor of the Government the importers must necessarily take the initiative, but the Treasury Department will co-operate cordially in expediting the hearing of the case. With regard to the Department's attitude, Assistant Secretary Spaulding, in charge of customs matters, said to the correspondent of *The Iron Age*:

"We do not doubt that the importers will appeal from the decision of the board, as this case involves all the points necessary to a judicial determination of the whole question, and is therefore a fair one upon which to test all the issues concerned. The law allows the importers 30 days from the date of the decision of the board in which to give notice of an appeal, but in view of the desire to settle the matter at the earliest possible date, we take it for granted they may note their appeal at once, and this Department will be glad to ask the Attorney-General to unite with counsel for the other side in moving the court to advance the case in the hope that it may be heard, if not determined, at the present term. It is to be regretted that so much time must necessarily elapse before a final decision, but the matter is of such consequence that the judicial proceedings must take the full course. By advancing the case in the Circuit Court, and possibly in the Circuit Court of Appeals and the United States Supreme Court, a decision may be had upon all points at the October term. This seems a long time to wait, but there is no shorter course.

"It is, of course, gratifying to the Department that its action should be sustained by the Board of General Appraisers, and we are hopeful that the Russian Government will be convinced from the arguments and rulings in this case that the action taken in imposing a countervailing duty on Russian sugar is not a discrimination against Russian commerce, for it goes almost without saying that the action taken in this case is identical with that already taken with regard to other countries, and there has been no purpose to single out a Russian product, the Secretary of the Treasury being guided solely by the letter and spirit of the law.

"It might be well to state in this connection that the Treasury Department has no official connection with the movement now being made to induce the Russian Government to rescind the decree levying special duties upon certain American iron and steel products. This matter is a subject for diplomatic negotiations, and we are advised is receiving full consideration by the State Department."

### Ex-Assistant Secretary Vanderlip in Russia.

It is an interesting fact of considerable significance that ex-Assistant Secretary Vanderlip, who was still an official of the Treasury Department when Secretary Gage issued the order levying a countervailing duty on Russian sugar, is now in St. Petersburg on a tour which possibly combines considerable business with pleasure. When Mr. Vanderlip left the Department he provided himself with copies of all the documents in the Russian sugar case, and these he now has with him. While he is without official status, yet the importance of the position from which he has recently retired, taken in connection with his close personal relations with Secretary Gage and thorough familiarity with the subject in hand, will, it is thought, enable him to make unofficial but influential representations to the Russian Government that may be of material assistance in the adjustment of the controversy. Mr. Vanderlip carried many letters of introduction, and will be in position to aid Ambassador Tower in convincing the Russian Government of the good faith of the Department in its declaration that no discrimination against Russia has been designed.

### Judge Tichenor's Dissenting Opinion.

As the dissenting opinion of Judge Tichenor of the Board of General Appraisers, in which he holds that the Russian Government does not pay a bounty on exported sugar, is expected to form the basis of the importers' appeal, the Treasury officials have examined it with much care and are disposed to take sharp issue with several points made. In the first place, the Department does not agree that the rebating of a tax does not constitute a grant or payment, as alleged by Judge Tichenor, and it is maintained that "payments" may be made either by an actual transfer of money or by omitting to collect a tax. In the second place, it is pointed out that Judge Tichenor's entire opinion is based upon the contention that the action taken by Russia in remitting the internal revenue tax on exported sugar is identical with that of the United States in omitting to collect the internal revenue tax on distilled spirits, &c., manufactured for export in bonded warehouse. This contention is claimed to be unsound because of the fact that while the United States makes no effort to limit the production of distilled spirits, Russia fixes from time to time the total amount of sugar that can be produced for domestic consumption and provides an increase in the profits of the refiners in proportion to the amount that is exported. The bounty feature is claimed to be based upon the limit placed on production for domestic consumption, a feature which is not found in any United States laws or customs regulations.

In the third place, the Department holds that the Russian laws provide a very important advantage, not developed in the argument in this case, in that a Russian sugar manufacturer located conveniently as to export facilities, but inconveniently for the purpose of sale for domestic consumption, may export his entire product and then transfer his export certificates, which allow additional production, to another refiner in some other part of the Empire who may be so located as to turn his product into domestic channels at low cost for handling. In this way enormous savings in freights, storage and distribution would be made by the entire industry, and export certificates would thus have a greater value. The Department officials claim that under these circumstances Russian sugars can profitably be exported and sold in the United States far below cost of production, which it is held is exactly what the countervailing duty provisions of the Dingley act were intended to prevent.

The State Department has published for the information of exporters the text of the order of the Russian Minister of Finance dated February 15, 1901, which has already appeared in *The Iron Age*. Consul-General Holloway of St. Petersburg has reported to the Department that gold mining machinery intended for the Urals and Siberia and such agricultural machinery as was included in the ukase of 1898 are not affected by the order authorizing additional duties, but are still admitted free. The ukase referred to provided for the free admission of the following articles:

"Such agricultural machinery and implements as are not produced in Russia, and the production of which requires special technical facilities, or which are patented, and therefore cannot be established in the near future—viz., harvesting and stacking machines, sheaf binders, steam plows, complex threshing machines with double drums, tedders, horse rakes, assorting machines for grass seeds, assorting machines for potatoes, manure spreaders, pulverizers for sprinkling vines and trees, injectors for sprinkling sulphurous carbon under the roots of the vines in order to destroy the phylloxera, uninterrupted grape pressers, centrifugal cream separators and their parts, &c."

W. L. C.

The Chicago Union Transfer Railway Company, Chicago, have issued a notice that the switching yards of that company, now under construction in the township of Lyons, Cook County, Ill., on what was formerly known as the Stickney Tract, having connections with the Belt Railway of Chicago, the Chicago Junction Railway and the Chicago Terminal Transfer Railroad, will be known as "Chicago Clearing Yards."



## Lake Iron Ore Matters.

DULUTH, MINN., April 6, 1901.—Additional sales are being made on the lake ranges of ore properties to both the United States Steel and to outsiders. An important deal has been closed this week on the Mesaba, being the sale of a 20-cent lease on what is called the McCahill tract for \$500,000 to the Shenango Iron Company. The latter are a local concern and the names of their incorporators give no hint at their affiliations, but it is to be supposed that the company are connected with some of the independent interests of the Valleys. They will have an important source of ore supply. The property contains about 12,000,000 tons, it is stated, and much of it is Bessemer. The price paid is a large one, and the maps of the exploration do not indicate that any wonderful bargain was secured by the buyers. The tract was to be had four months ago at little more than half the price now said to be paid. Since then explorations have widened and bettered the ore body. There is a good deal of ore in the property that would not have been considered merchantable a few months ago, and that it can now be figured on is an indication of the change going on in the estimation of low grade ore properties. Still most of this ore was not estimated in the deal.

On the same range the Hale, Kanawha and Roberts are under option for sale at good prices and will probably be taken. Other options are also out and some interesting negotiations are under way. The Hale and Kanawha are non-Bessemer, but of good structure, and the Roberts is a property of no great size. They are classed with the "Sellwood interests." Several other Sellwood properties are under option, a pair of Bessemer mines on an older range at a large price.

The Mesaba Central Exploration Company have given a lease at 18 cents a ton on a part of the north-western quarter of section 14, 58-19. The Biwabik Mining Company have leased 40 acres in section 2, 58-16, at \$15,000 for 100,000 tons of ore and at 30 cents a ton for all in excess of that amount. The 100,000 tons is to be moved in three years.

Some weeks ago I spoke of the probability of the purchase of the Columbia mine, Crystal Falls, by the Oliver Company. The deal has been concluded. Columbia ore is a standard non-Bessemer carrying about 0.55 per cent. phosphorus and 62 per cent. iron. The mine has had more vicissitudes than customarily fall to the lot of any properties. Ore has been found about 5 miles north of Amasa, in a district where its existence has not heretofore been assured. Crerar, Clinch & Co., who held the Mansfield and Columbia, have the Bird exploration and are negotiating for other properties in the vicinity.

Some rather surprising sales have been made of late on the Mesaba range, chiefly to the Eastern Minnesota Railway. One was fee and share in 58-19, on which about 7,000,000 tons of ore had been shown, for \$150,000. Now the price is low if the ore is good, but the assays show almost the entire body of ore to be non-Bessemer. I should think, on a hasty running over of all the assay reports, that the entire ore body was not over 55 per cent. iron and not less than 0.075 per cent. phosphorus. There is about 75 feet of fair Bessemer ore in one hole. Much runs down to 50 per cent. iron. The major portion of the ore body carries an 18-cent royalty and a 50,000-ton annual minimum. Under ordinary conditions this ore cannot be put on the market for years, but the interest on first cost and \$9000 a year royalties will accrue steadily. Ultimately the Eastern Minnesota expect to secure the profit on the haul to Duluth of the entire 7,000,000 tons. They can, perhaps, afford therefore to pay such prices. Nobody else can.

The Elba and Corsica mines, Mesaba range, are now understood to be the possession of the Buffalo Steel Company. If this company have not only these, but all the Pickands, Mather & Co. mines as well, they will be able to secure from them all less than half their expected ore requirements.

DULUTH, MINN., April 20, 1901.—Ore shipments to docks on Lakes Superior and Michigan have commenced and are now quite large, though there are practically no boats moving and no great signs of any soon, though the engineers meet Sunday. This is on account of the strike of the marine engineers, and the vessel owners are making little or no effort to come to agreement, intending to let the strike take its course. A delay of a few weeks or a month or so in starting their vessels would not be displeasing to the shipowners, for the indications are that such delay will advance freights to a point where they would become fairly remunerative, and the entire business of the year can be transacted in a season cut short by several weeks.

Mining men are at sea as to their work, not realizing just what allotments of ore they will be called upon to furnish. This is on account of the fact that the United States Steel Corporation have not yet been able to get down to the minutiae of operation. Jas. Gayley has taken charge of all mines, &c., and is at work straightening things out. He does not expect that the Minnesota mines of the corporation will ship much in excess of last year, and feels that he has an abundance of transportation facilities on all ranges without any additions. The two Minnesota roads belonging to the corporation last year handled about 8,000,000 tons, and it is not now probable that they will greatly increase this the present season. There will not be much increase on any other range by their mines. The Eastern Minnesota road, in Minnesota, will probably show the chief increase in business of any ore transportation system of them all, and its managers expect to show an increase of 50 to 75 per cent. over 1900.

### Corporation Ore Managers.

It is stated here that F. E. House of the Conneaut-Pittsburgh line will come to Duluth to manage the Duluth & Iron Range and the Duluth, Missabe & Northern roads, and that President Olcott of the latter system will become general manager of the Mesaba mines of the corporation. T. F. Cole, general superintendent of the Oliver Iron Mining Company, will also be stationed at Duluth and will have a position much similar to that now held by him, while Dr. N. P. Hulst, manager of the Oliver Company, will have general technical direction of all the mines of the corporation on Lake Superior. The management of the immense fleet, 112 ships, will be in the hands of A. B. Wolvin of Duluth, and the direction of the vessels will be from this city. The management of ore distribution on Lake Erie will be by Edwin S. Mills, with the title of assistant general manager, with offices at Cleveland. Mr. Mills has been Cleveland agent for this work for the Oliver Company since their formation and is well qualified for the tremendous duty of distributing 10,000,000 or more tons a year. Mr. Wolvin's abilities as a fleet manager are too well known upon the great lakes for any comment or praise. It is expected that Mr. House will be as popular and able at Duluth as he has been in the management of the Bessemer road, and the only wonder in connection with his appointment is that the Eastern end of the corporation are willing to let him off, even to such an important job as that of the Minnesota end. He takes the places that have been filled by Messrs. Greatsinger and Olcott.

### Ore Purchases.

The big deal between the United States Corporation and the Cleveland-Cliffs Iron Company for the sale of the latter's Ishpeming and other mines to the former has been declared off, and the Cleveland-Cliffs will maintain their independence.

Deals for the sale of properties on the various ranges are in progress steadily. I learn that P. L. Kimberley has been fixing up a job lot of mines to sell to the corporation. These are to include the Antoine and Keel Ridge on the Menominee and the Columbia, Kimberley and Itasca on the Mesaba. The price asked is \$5,000,000. The Antoine is a very large deposit of low grade siliceous ore, cheaply mined, and of importance. The Keel Ridge is a small property of the same character.

Columbia is a small deposit, part Bessemer and very wet. The Kimberley is three undeveloped forties that have been explored to show an ore body of high grade Bessemer, but not large. The Itasca is a State lease bought a few weeks ago by Mr. Kimberley for \$68,000. All but this last are fee properties. It is scarcely to be believed that the asked price will be secured.

There is a furbishing up of old leases and options, and several development and exploring companies are being formed to re-explore lands that have not, it is considered, been sufficiently determined. A number of State leases on the Mesaba, as well as private lands, have recently changed hands. A deal is now on for the sale of a lease of high grade Bessemer, the assays showing splendid ore, to an Eastern outside interest. This is about the only really high grade Bessemer proposition now in sight. Quite a number of Eastern ore men and furnace representatives have been here of late looking up ore. Among them have been the Jones & Laughlins interests, who have in past years been offered at low prices about everything of any good on the Mesaba range that has been for sale, but who have persistently turned each deal down. Other Eastern furnacemen are just far enough behind the procession to fall to catch hold of anything. Actually there is not a single Bessemer proposition on the Mesaba range that is now in free hands for negotiation, though some sales pending may not, of course, be closed. There are with us always, to be sure, the explorations, but these are narrowing fast, and the best that can be said of many of them is that they present a reasonable opportunity.

#### The Mesaba Range.

With the exception of the Kimberley deals, outlined above, and of some continued negotiations by the Eastern Minnesota road, there is nothing in the way of ore transfers on the Mesaba in shape to report. A great amount of interest is manifest all along the line, and the most westerly explorations, that turned out unsatisfactorily several years ago, are now being tested once more in hope that a better ore may be found. Two diamond drill contractors have 40 drills now at work, having just bought eight, and drill runners are now scarce, so that additional crews will be hard to put in. The Duluth, Missabe & Northern, which was building a branch to the new Stevens mine, has abandoned the work since the consolidation, and the ore will be hauled by the Duluth & Iron Range, whose main line runs close by. The Missabe had carried on considerable maneuvering to get this haul, and no sooner got it than the combination made maneuvering unnecessary.

#### Gogebic Range.

On the Gogebic range the Tilden's new shaft will be operating in a few days, and will employ 200 men. No. 10 shaft is working heavily. The West Colby (old Valley) is preparing for much development work at its newly discovered bodies of ore. The Schlesinger interests are working 200 men at the Anvil, which has been idle for 12 years. The indications are of the best. The Mikado is to ship heavily and is a large property with some splendid ore opened into. Every mine at Wakefield is busy, an unprecedented condition. The old Chicago, Alpha and Comet are hard at work, and the Brotherton and Sunday Lake are mining heavily.

An option on the Barasa mine, Negaunee, has been taken by the Oliver branch of the United States Steel. Many think the Barasa an exceedingly good gamble for a large proposition. The Cascade, at Palmer, has resumed, and the Moore, of the American Mining Company, has started up. Arrangements are closing for resumption at the Imperial, Webster and Bristol mines, at Michigamme, two of which were operated by the Cleveland-Cliffs last year. The Richmond will resume, and about all the siliceous ore mines of the district will be busy, made so by the probable demand for rich Mesaba Bessemer.

There is more ore in stock at Ishpeming mines than ever before, even last spring being eclipsed. Besides the big mines, East New York and Winthrop piles are of goodly size.

Five drills are deep in the ledge at the Cleveland-Cliffs' explorations at Negaunee. Several shafts will be sunk in the foot and the drill work will be carried on till a pretty definite knowledge of the conditions is gained.

The Minnesota Abrasive Company have been formed at Duluth, capital \$1,000,000, to work two hills of corundum recently found near Baptism River and Carlton Peak, about 60 miles northeast from Duluth. The decomposed material has been tested and is found to be excellent for abrasive purposes, having a remarkable grit.

Stock allotments of the Calumet & Arizona Copper Company were made last week, the Lake Superior subscribers being cut 3% per cent. and the Carnegie pool at Pittsburgh 40 per cent., this latter because they subscribed \$400,000 more than they had been allotted in the preliminaries. The stock of the company is said to have advanced to 350 to 400 per cent. The call for full payment is to be made for May 10. D. E. W.

**The Illinois Tube Works.**—A new enterprise has been started in Chicago for the manufacture of structural tubing for a variety of purposes. It is located at 45 to 55 East Huron street, under the name of the Illinois Tube Works, of which Louis O'Neill is proprietor and F. F. Bischoff is manager. Special machinery built under patents owned by Mr. O'Neill has been installed for the production of the tubing. The process employed is that of rolling the tubing through dies from steel strips which are purchased of the necessary width for the desired diameters. The machinery is ingenious and is adapted to the rapid production of the tubing. Six sizes are turned out, the largest size being 1½ inches and the smallest being rods for umbrella handles. The tubing made at present is simply butted at the seam and not brazed or welded; nevertheless, a very close joint is made which has been found to hold water when tested. The neatness and character of the work done are thus admirably demonstrated. Arrangements are now under way for the completion of a brazing plant, and later on an electric welding apparatus will be installed, to enable tubing to be made for purposes requiring it to be both air and water tight. The tubing now turned out is largely used for the manufacture of bedsteads, but is also adapted to the use of agricultural implement manufacturers and others who use tubing for its lightness and strength in various forms of construction. It is expected that this tubing will also be largely used in making conduits for electrical work. For this purpose very smooth steel is used, and as it is worked cold the polished surface of the steel is preserved. For the same reason the exterior is in good condition for enameling, as in the case of bedstead work. The factory is conveniently located and has every facility for the rapid handling of material and for the extension of production as the growth of the business may require.

**The Iron Age Index Supplement.**—Our attention has been called to the fact that in the April issue of *The Iron Age Index Supplement* an omission was made of the name of E. M. Shaw, Bannan Building, Providence, R. I. Mr. Shaw should have been indexed under the headings, Castings, Malleable Iron, and Castings, Steel, but through an inexplicable oversight this was not done. The Blakeslee Forging Company of Plantsville, Conn., should have been placed under the headings Forgings, Bicycle; Forgings, Carriage; Forgings, Drop; Forgings, Gun; Forgings, Iron Special, and Forgings, Steel.

**The Largest Emery Wheel.**—The Norton Emery Wheel Company of Worcester, Mass., have recently finished the largest solid emery wheel ever made. It measures 60 inches in diameter, is 10 inches wide and weighs 2127 pounds, net.

Skinner & Clark, 19 South Canal street, Chicago, who recently secured the Western agency of the Bradford Belting Company, Cincinnati, have added a full line of Monarch pulleys to their general stock.



## Notes from Great Britain.

### A Working Combine.

LONDON, April 6, 1901.—One of the leading personalities in British engineering is Arnold F. Hills, chairman of the Thomas Iron Works, Shipbuilding & Engineering Company, Limited. The extent of this company's operations is vast, for not only do they build battle ships for the various European Governments, but ships for the mercantile marine. They employ about 5000 operatives in their engineering shops, and at the present moment have in construction engines developing 60,000 horse-power. The works are admirably situated at Deptford, Blackwell and Greenwich. Arnold F. Hills was the first leading engineer to work on the eight-hour system with sound economic results. Last Wednesday the annual meeting of the company was held and at it the chairman made an important announcement. He said that he believed their electrical works would become an important feature. They had now formed an English combination with Siemens & Co., Mather & Platt and the British Electrical Engineering Company which would, he believed, successfully hold its own with the American and German combinations. The capitalization of these schemes, so far as the electrical equipment is concerned, is nearly \$10,000,000. This arrangement, as sketched by Arnold F. Hills, apparently does not amount to a trust, but rather indicates a working arrangement with many of the advantages of a trust, and possibly with fewer disadvantages.

Arnold F. Hills made another equally interesting announcement. The difficulty of coaling battle ships while at sea has long been a perplexing problem at the Admiralty. The best plan is that known as the Miller system, which has worked with partial success, delivering about 20 tons of coal per hour to a battle ship while steaming. Indeed, this American plan is practically the only one. A. F. Hills now says that, with the assistance of Mr. Mackrow, their naval architect, they have produced a system calculated "to knock the bottom out of the American plan." He claimed for it that it could deliver from 50 to 100 tons per hour. The Admiralty is considering its feasibility. If the statement is at all accurate we shall hear more of it.

### A Useful Invention.

Professor Ripper, principal of the technical department of Sheffield University College, has invented what seems to be a really useful little contrivance for accurately measuring the air flow as it enters the boiler furnace under the fire box under natural draft conditions. The idea of the invention is to indicate if any of a series of fires is being neglected. The large loss caused by the excessive amount of air passing into the flues and cooling them without having done its share in combustion is mainly due to defective firing. From 30 to 50 per cent. of heat goes into the chimney instead of, say, 20 per cent. Professor Ripper's device will enable a foreman or manager to see at a glance if the fireman is neglecting his work and wasting fuel. It should be noticed that this device is for the draft going into the fire from beneath. There are, of course, several contrivances to record the rate of draft in the flues beyond the fire.

### Sheffield Up in Arms.

The Sheffield steel manufacturers and experts are up in arms against a report of the Board of Trade on steel rails. The genesis of this report is interesting. On December 10, 1895, the Scotch express train, running through St. Neot's Station, met with a disastrous accident, due to the fracture of a steel rail. This fractured rail was immediately afterward found to have broken into 17 pieces, the longest 22 inches in length. Mainly in consequence of this accident the Board of Trade appointed a committee to investigate the causes which lead to the weakening of steel rails during their prolonged use on railways. It was a fairly strong committee, but, as Professor Arnold of Sheffield contends, there was a fatal weakness because there were no specialists in the chemical and micrographic analysis of steel appointed. The consequence of this is that the

analytical methods employed were "antiquated and cumbersome," to quote the professor. For example, the method employed for the slag determinations was Blair's modification of the Eggertz iodine method. The result is that the conclusions and recommendations of the committee are scoffed at. There is also a stern, practical moral. It appears that these rails had been actually analyzed by Professor Arnold 20 years ago, and prior to their delivery to the railway company. He then declared that they contained 0.5 per cent. of copper, a fact apparently ignored by the committee. The committee's chief recommendation is as follows: "It appears probable that a great improvement might be effected by reheating the finished rail after rolling." This argues a defect in the steel, which Professor Arnold strenuously denies. He points out that only one rail in 3000 breaks in use—surely a most creditable result so far as British steel makers are concerned. The professor's explanation is certainly more credible and lucid than the quasi-scientific conclusions of the committee. He says the failure of the rail was due to a gradual weakening of the adhesion between the constituents along sharp junction lines, owing to the influence of vibration during a period of 22 years.

### The Quarter's Trade.

LONDON, April 13, 1901.—With the conclusion of the March trade we can judge, in perspective, of the extent of British trade during the first quarter of the year. It indicates a period of growing depression. Compared with 1900, there is an all round reduction in the export trade of 25 per cent. The figures are startling:

	Three months, 1900.	Three months, 1901.
Metals and articles manufactured there—		
from .....	\$58,421,000	\$47,021,000
Machinery and millwork .....	23,821,000	21,295,000
Ships, not registered as British .....	5,975,000	17,962,000

From the above table it is evident that only the shipbuilding trades are busy. The other staple trades are equally rocky, particularly textiles. And had it not been for the enormous export of supplies to the seat of war the quarter's returns would present a woe-begone appearance. British manufacturers are quite open in expressing their fears as to the immediate future. At their various sectional conferences ways and means are discussed, but no better things are prophesied.

The more detailed figures relating to the quarter's trade only deepen the gloom. Take pig iron. During the first quarter of 1900 we exported 379,000 tons; last quarter the total was only 163,000 tons. The biggest decline is observable among our best customers—Germany, Holland, Belgium, France, Italy. Our total to the United States was 4800 tons, as against 18,000 tons during the first three months of 1900. The same falling off is chronicled in bars, angles, bolts and rods—a fall from 43,000 tons to 25,000 tons. Again it is Britain's best customers who have thus seriously curtailed their orders. In railroad material the figures are about stationary—123,000 tons in 1900; 127,000 tons last quarter. In detail the figures read: Rails, 98,000 tons; chairs and sleepers, 15,000 tons; unenumerated, 13,000 tons. During the quarter under review the exports of unwrought steel fell from 91,000 to 47,000 tons, but there was a slight increase in manufactures of steel or steel and iron combined—9100 to 10,800 tons, most of it to countries not specified. The gross totals are as follows:

Iron and Steel.			
	Three months, 1899.	Three months, 1900.	Three months, 1901.
Tonnage .....	708,653	962,457	616,826
Value .....	\$27,000,000	\$41,000,000	\$30,000,000

### Machinery and Mill Work.

Turning to machinery and mill work, there is a decline to be noted in steam engines. Locomotives fell from \$2,300,000 to \$1,800,000, the worst drop being in our trade with South Africa, India and Australasia—a curious commentary upon the economies of colonial expansion. We increased our trade in locomotives with Spain, the smaller European countries and South America. Agricultural machinery fell in value from \$750,000 to \$650,000. Here, again, the same phenomenon



appears—a marked decrease in our colonial trade and an equally pronounced rise in the demand from foreign countries, especially South America, which purchased \$35,000 worth, as compared with \$10,000 during the first quarter of 1900. Other forms of steam engines exported amounted to \$2,300,000, an increase of \$300,000, mostly new business.

This unsatisfactory condition of the British export trade undoubtedly reflects the state of the home market, about which no returns are available. It is, I think, clear proof that Great Britain is on the eve of a serious trade depression, the results of which no man can foretell.

#### The Markets.

The metal markets, while not stagnant, are far from healthy. The temporary absence of American competition continues, to the complete satisfaction of British manufacturers, but Belgian competition in cheap iron is severely felt in the Midlands. Thus, while merchant iron in the Midlands is offered at \$32, the Belgians are selling their No. 2 bars, f.o.b. Antwerp and Rotterdam, at \$25.50, and in London docks at \$26.25. It follows that export merchants are hard hit. They feel it the more keenly at the moment because of the receipt of a number of orders and inquiries from Cape Colony and Natal. Buyers in South Africa are hopeful that the war is nearly over and are stocking in readiness. The home trade in unmarked bars is steady in small orders for immediate consumption. The marked bar makers have still a considerable number of orders in hand and are, therefore, maintaining their standard price at \$47.50. Even when they have worked off their orders they affirm they cannot reduce prices until fuel comes down. It is asserted on their behalf that the cost of production has only decreased \$2.50 since the boom of last year, while their own prices have fallen over \$8. Taking a broad view, there can be no doubt that, notwithstanding a fairly large sprinkling of niggling little orders, there is very little effective demand in the metal markets for either iron or steel. The situation at the moment is saved by a certain briskness in ship and bridge building, railway rolling stock and electrical engineering. In point of fact, the market just now is a veritable Chinese puzzle. It is certainly vastly and dramatically different from this time last year, when Scotch warrants were firm at \$20, while yesterday's quotations were \$13.50. Standard prices are approximately: Marked bars, \$47.50; unmarked, \$32.50; North Staffordshire, \$35; sheets, singles, \$36.25; doubles, \$36; trebles, \$40; galvanized corrugated sheets, f.o.b. Liverpool, \$44; hoop iron \$35; rail, rod and rivet iron, \$35; gas strip, \$35.

Steel: Bessemer billets, \$25; best Siemens, \$26.25; mild steel bars, \$36.25; steel plates, \$35; steel girders, \$31.25; steel angles, \$31.25.

Pig iron: Staffordshire cinder forge, \$11.50; part mine, \$12; all mine, \$13; cold blast, \$26.50; Northamptonshire, \$11.50; Derbyshire, \$12; Lincolnshire, \$12.50; North Staffordshire, \$12.50.

Apart from these standard Midland quotations, the actual prices on the market yesterday (Friday) were: Scotch, cash, \$13.20; Scotch, one month, \$13.20; Middlesbrough, cash, \$11.15; Middlesbrough, one month, \$11.16; W. C. hematite, cash, \$14.30; W. C. hematite, one month, \$14.25.

It is rumored that some of the home railways are about to give out large contracts for locomotives, rolling stock and general stores. Many branches of the trade are eagerly awaiting more definite information.

#### Big Earnings.

Notwithstanding the slump in trade some firms are doing uncommonly well. Thus, Bell Brothers of Middlesbrough, whose chairman, Sir Lowthian Bell, is so well known on both sides of the Atlantic, announce a profit on last year's transactions of \$1,800,000 and a dividend of 25 per cent. In this prosperity the operatives share, their wages having been advanced 65 per cent. above the standard. Sir Lowthian Bell, in moving the adoption of the report, said that they had turned out 322,000 tons of pig iron. One of the great questions of the day was how far would they be able to compete

with the rest of the world. They were at a great disadvantage in regard to labor and the richness of the ores in some parts of the world, but while in those places the distances which the minerals had to be carried were measured by thousands of miles, the raw material they used lay within a radius of 25 miles. He thought that, having regard to their facilities and material advantages, they could meet the world at large with anything approaching fair play. Sir Lowthian Bell is notoriously an optimist, and it is always the under dog who likes to define "fair play."

#### The Times Critic Concludes.

The series of articles in the *Times* on "American Engineering Progress," to which I have previously referred, ends with an instructive dissertation on "The Human Factor." The writer feels cramped for room. He would like indefinitely to enlarge the scope of his inquiry, so fruitful is it of suggestive matter, but he recognizes that there is only one cure for literary elephantiasis, and that is the knife. He finishes, as he started, by emphasizing the enormous wastage in youthhood so prevalent in this country. The young man in America is rewarded for his attainments; in England he is ignored because of his age. This is the burden of our critic's *nunc dimittis*. The article is studded throughout with sparkling epigrams. As thus: "The American hustles from his boyhood; the Briton plods. It is a detail that the American workman hustles for ten hours a day; the Briton plods, so far as popular opinion and shop stewards allow, for nine." I quote the most striking passage:

"If American blast furnace practice is more productive than our own; if American steel works are better equipped than our own; if American machine tools are more ingenious than our own; if American electrical plant is commanding even our own market; to whatever we turn we find it is the human factor—character—that commands the situation. Even the rich iron ore of the Lake Superior district, far distant from the place where it is used, has been made available by the ingenuity and enterprise of American engineers and men of business. This thing is patent, and yet, in discussing the problem, we avoid it.

"What the conditions are that have brought the present state of affairs about may perhaps be summed up in one phrase—our overwhelming success in the past. We have thought ourselves secure; we have relaxed vigilance and eased the burden. Our young men are kept back until their best energies have run to waste; and we have a system of labor employment which strives, not without success, to keep labor at an average of the lowest level.

"It is the wise conception of what will work out to his own advantage which so largely distinguishes the American business man. Such a gift does not come without seeking. It means thinking of business with a concentration of mind that, to the average European, is 'phenomenal.' To the American business is a science, and he follows it almost with the enthusiasm of a scientific devotee. No risk of personal discomfort is too great; his alertness is never at fault; success does not blunt his devotion. The Briton is educated to a hundred distractions; in America there is practically no leisured class of young men."

After this we may indeed be prepared for severe trade depression. S. G. H.

The South Chicago works of the Illinois Steel Company report some new records. During the month of March the steel works turned out 76,311 tons, the best week being 18,000 tons, and the best straight 12 hours, 1772 tons. One rail mill in 52 turns made 61,930 tons for the month. For the week ending March 23 they made 15,109 tons. The best 24 hours' run was March 1, 2779 tons, the mill changing rolls from 80-pound to 85-pound section during the 24 hours.

The Chicago Engineer Supply Company will move May 1 from 167 Lake street to larger and more desirable quarters at 112 and 114 East Lake street, Chicago.

## The New Ore Carrying Fleet of 1901.

BY WALDON FAWCETT.

The additions which will be made during the season of navigation to the fleet of vessels on the Great Lakes designed especially for the transportation of iron ore will be none the less notable in point of numbers and capacity than those of former years, but some of the conditions governing their operation will be markedly at variance from the apparent trend of transportation interests on the inland seas during the closing years of the century. For instance, whereas 17 of the 37 vessels building or under contract in the shipyards of the Great Lakes at this time a year ago, representing in the aggregate considerably more than one-half the aggregate carrying capacity of the new fleet, were building to the order of the great iron mining and manufacturing interests of the country, the new fleet now under way does not include a single vessel laid down upon the order of such interests.

Many circumstances have combined to bring the situation to its present status. Several of the largest vessels building in the spring of 1900, avowedly for the ore trade, were designed for the Carnegie interests. The agreement entered into some months since between the Rockefeller interest and representatives of the Carnegie corporation, covering the transportation of ore from the Lake Superior district at a fixed flat rate and extending over a period of years, presumably obviated the necessity of the Pittsburgh interest extending their operation in the transportation market. Moreover, the policy pursued by the Carnegie officials both prior to and since the memorable attempt of the Rockefeller representatives, in the winter and spring of 1900, to force carrying charges to a higher level, indicated clearly their indisposition to engage in the management of vessels, were it not absolutely necessary to secure what they deemed an equitable rate. In short, had the Rockefeller "corner" not been attempted, it is improbable that the Carnegie Company would have contracted for the construction of a single boat.

Finally, the great consolidation under the corporate title of the United States Steel Corporation have loomed up as a most important factor in the situation. The possibility of their formation may have deterred iron and steel interests who would otherwise have been represented in this year's building programme in the shipyards of the Great Lakes, and certainly no action looking to the enlargement of their fleet need now be expected from the great corporation until experience or careful calculation has demonstrated how nearly the requirements of their ore transportation can be met by the vessels already within their control. Then, too, the United States Steel Corporation are manifestly in a protected position. Their fleet, especially since the acquisition of the Rockefeller vessels, is of a size to facilitate the regulation of carrying tariffs, even should it be found necessary to employ some outside tonnage.

### The Holdings of the United States Steel Corporation.

In order to indicate the relative position which the United States Steel Corporation hold in the iron ore transportation market on the lakes, it may be well to digress for a moment to consider the holdings of the newly formed combination. The vessels which come into their possession by virtue of the amalgamation of properties are 56 in number, all of steel construction. This fleet includes 22 vessels of the Minnesota Steamship Company, an interest affiliated with the Federal Steel Company; 13 vessels owned by the Carnegie Company and operated under the name of the Pittsburgh Steamship Company; 12 vessels from the American Steamship Company, an organization within the American Steel & Wire Company, and nine vessels of the Mutual and Menominee lines, operated by the firm of M. A. Hanna & Co. of Cleveland for the National Steel Company. Added to this tonnage by the purchase of John D. Rockefeller's properties on the Great Lakes and in the Lake Superior district is a further fleet of 56 vessels, including, of course, the whaleback fleet which the Standard Oil magnate acquired by outright purchase

from the American Steel Barge Company something over a year ago. Three of the Rockefeller vessels thus transferred are now engaged in the coasting trade on the Atlantic, but may be returned to the lakes if desired. The United States Steel Corporation's fleet of 112 vessels comprises all the largest vessels on the lakes and a great majority of the most modern steel carriers. The aggregate carrying capacity in a season of average length and under ordinarily favorable conditions is placed at about 9,750,000 tons, or something like 900,000 tons less than the mines now controlled by the new corporation produced last year. It has been figured at a rough approximation that the plants of the combination will, if operated to their full capacity, consume somewhere near 12,000,000 tons of iron ore each twelve-month, so that there would seem to be ground for the supposition that the new consolidation will find it necessary to depend in some degree upon the individual vessel owners on the lakes.

### Individual Vessel Holders.

The change in conditions in the ownership of vessels now under construction, previously noted, has taken the form of a virtual exchange of positions. A year ago almost all the large modern steel vessels under construction at the shipbuilding plants on the lakes were under way on commissions from the iron and steel companies, scarcely a half dozen of the more pretentious craft having been ordered by individuals. To-day the iron and steel producing interests do not figure to any extent whatever in the bookings at the shipyards, while, on the other hand, individual vessel owners have invested heavily. Whether this would have been the case could the vessel owners have foreseen the formation of the giant combination is doubtful, but nevertheless the future may hold more favorable conditions for the independent vesselmen in the ore carrying trade than present circumstances would portend, and at least these outside vessels will have to be taken into consideration in any speculation relative to capacity and carrying charges.

In the spring of 1900 there were building in the shipyards on the Great Lakes a total of 37 vessels, with a combined carrying capacity of 185,000 tons, and an aggregate valuation of \$8,902,000. At the present time there are building or under contract 62 vessels of a combined capacity of 193,550 tons and an estimated value of \$12,815,000. A comparison of the make up of these two fleets discloses some points of interest. Steel construction appears to be about relatively predominant in the two yearly programmes. Of the 37 vessels contracted for a year ago not more than three or four were of wood, while of the 62 vessels now under way all but six are of steel. Getting down to what might be termed net results, it is found that whereas 34 of the vessels turned out last season were cargo carriers, 49 of this year's output will be adapted for the transportation of bulk commodities. Making allowance for vessels designed for combined passenger and freight service and package freighters, the capacity of the vessels available in so far as their construction goes for ore transportation is found to be less than 10,000 tons greater in the aggregate in 1901 than it was in 1900, although this year's fleet shows a gain over last year's, numerically considered, of more than 67 per cent. This apparently surprising discrepancy is due to the difference in size in the vessels making up the new fleets for the respective years, a point which will be touched upon later.

Of some significance, in view of the development of the Canadian iron ore mining interests on the north shore of Lake Superior and the growth of the iron and steel manufacturing interests at Cape Breton and elsewhere in the Dominion, is the number of new vessels built in conformity to "canal dimensions"—that is, vessels capable of passing through the locks of the Welland and St. Lawrence canals, and limited therefore to some 270 feet in length and 3000 tons carrying capacity. In the spring of 1900 there were seven such vessels under construction, the carrying capacity of which, in round numbers, might be computed at 21,000 tons. This year there are ten vessels under construction with a view to the requirements of service on salt water, but only six of them are adapted to the transportation of iron ore



from shipping docks on Lake Superior to ports on the lower St. Lawrence, should it be desired to utilize them in such service.

#### A Return to Smaller Vessels.

Quite as distinctive as the manner in which the individual vessel owner has this year supplanted the iron and steel manufacturing interest as a purchaser of new lake tonnage is the apparent revulsion of feeling with reference to the fresh water ore carrying craft of maximum dimensions. A year ago the new vessels on the stocks included the four largest vessels ever turned out on the Great Lakes—vessels within a couple of feet of 500 feet in length, 52 feet beam and 30 feet depth, and with an estimated carrying capacity of 7900 tons of iron ore on a draft of 18 feet. Also under way at that time were several vessels for the Carnegie interest, these latter steamers being 474 feet in length over all, 50 feet beam and 28½ feet in depth, together with other craft ranging from 460 to 490 feet in length. This year, on the other hand, the largest vessels under way are but 450 feet in length, and there is a considerable number of prospective ore carriers, none of which exceeds 380 feet in length. This abandonment of the design for the largest practicable lake ships offers the solution for the very slight increase of carrying capacity of this year's new fleet over that turned out last season, despite the heavy gain in the number of vessels.

#### The New Boats.

In view of the new conditions which may be expected to present themselves as a result of the formation of the United States Steel Corporation, the independent vessel owners of the Great Lakes will probably look to a greater extent than ever before to coal, grain and other commodities to furnish cargoes for their vessels, but at the same time there are none of these freighters which may not be turned into the ore carrying trade just as in times past, should rates warrant it. Ranking first among the new vessels in point of size are the four steamers building at the Lorain, Ohio, and Chicago yards of the American Ship Building Company, for F. H. Peavey of Duluth. Each is 450 feet in length, 430 feet length of keel, 50 feet beam, and 28½ feet depth. The engines have cylinders 15, 23½, 36½ and 56 inches in diameter, and 40 inches stroke, steam being furnished from Babcock & Wilcox water tube boilers at a pressure of 250 pounds. The vessels will cost \$275,000 each, and each has a carrying capacity of 6400 tons. The American Company are building for C. W. Elphicke of Chicago two steel steamers of exactly the same dimensions and carrying capacity as those just described.

John Mitchell of Cleveland, and others associated with him, whose vessels have always engaged extensively in the transportation of iron ore, and whose principal craft were last year chartered outright for the season by John D. Rockefeller, have building at Cleveland two cargo steamers, each 436 feet in length over all, 416 feet keel, 50 feet beam and 28 feet depth. The engines have cylinders 23, 37½ and 63 inches in diameter and 42 inches stroke, and steam is generated in Scotch boilers working at 180 pounds pressure. The contract price of these vessels is given as \$285,000 each, the estimated carrying capacity of each vessel being 6000 tons. The Whitney Transportation Company of Detroit have a steel steamer coming out which is 424 feet in length and can carry 5500 tons of ore. The only other vessels over 400 feet in length building at the yards on fresh water are two steamers each 404 feet in length, destined for the Lehigh Valley Transportation Company of Buffalo, and likely to be used largely in the package freight business, and two steamers 443½ feet in length, building for parties in New York City, and which will be taken to the Atlantic Coast in sections and there re-erected.

D. R. Hanna of the firm of M. A. Hanna & Co. of Cleveland, acting for a corporate interest, has contracted for the construction at West Superior, Wis., and West Bay City, Mich., of four steel steamers which it is understood are to be utilized almost exclusively in the transportation of copper. Two of these vessels are steamers 336 feet in length, 318 feet keel, 42 feet beam and 26½ feet depth. Triple expansion engines and Scotch boilers

go to make up the machinery equipment. The cost of the steamers will be \$180,000 each, and the carrying capacity 4000 tons each. As consorts for the steam vessels, the same interest have under construction tow barges of slightly less dimensions, but equal carrying capacity. J. C. Gilchrist of Cleveland, an independent vessel owner, who has heretofore been known as a liberal purchaser of the older craft on the lakes, including some wooden tonnage, has come into the market this year with contracts for the construction of eight steel steamers. Six of these are each 366 feet in length, 48 feet beam and 28 feet depth, and, representing an investment of \$215,000 each, will be capable of moving in each case 4800 tons of iron ore on a draft of 18 feet. The other two vessels are slightly larger, each having a carrying capacity of 5000 tons.

Inasmuch as all the vessels above enumerated, as well as several other craft, are under contract with the American Ship Building Company, it will be readily seen that the consolidation of lake shipyards is well stocked with new work at all its plants. At the same time the operations of the yards outside the combination are of sufficient magnitude to justify attention. The 26 vessels under way in these plants comprise, however, a number of passenger steamers and fewer vessels the construction of which has been entered into with special reference to the requirements of the ore carrying trade. Messrs. Hawgood of Cleveland, who have always handled more or less iron ore business, have under construction at the plant of the Craig Ship Building Company of Toledo a steel steamer 260 feet in length, 43 feet beam and 26½ feet depth, which will cost \$175,000, and have a capacity of 3000 tons. At the yards of the Jenks Ship Building Company, at Port Huron, Mich., are several cargo carriers of the same capacity. This latter firm also secured only a few weeks ago a contract for a new steel freighter for the Minch estate of Cleveland. This vessel, which, by the way, will not be ready to go into commission before the close of the season, if she is then, will be a duplicate of the steamer "Capt. Thomas Wilson," built at this yard very recently. Her dimensions will be 440 feet over all, 50 feet beam and 28 feet hold, and 6500 tons capacity. The triple expansion engines will have cylinders 23, 38 and 63 inches in diameter, and 40 inches stroke, and steam will be supplied from three Scotch boilers.

It may be noted at this juncture that additions have never been made to the lake ore carrying fleet to anything like the extent that is shown by the shipyard contributions of the past year and those in prospect for the first twelvemonth of the new century. True, there have been years during the past decade when, considered either from a tonnage or numerical standpoint, the product of the lake yards constituted a greater proportion of the shipbuilding output of the country than at present, but never has actual carrying capacity been added to so heavily. The losses also are not of proportions sufficient to bring the net gain in carrying capacity much below that represented by the new vessels. Last year, for instance, 47 vessels passed out of existence on the lakes, but in a majority of cases they were wooden craft of moderate size, so that the total carrying capacity to be deducted did not exceed 27,700 tons, and much of this tonnage had not been employed in ore carrying, at least for many years previous to its effacement.

The Chicago, Milwaukee & St. Paul Railroad Company have completed a survey for a branch road which they propose to construct from Waukon, Iowa, to an iron ore deposit which is now being developed at a distance of 5¼ miles from that town. It is stated that the deposit is of great extent, and the ore is of excellent quality. Various interests are prospecting for ore in that vicinity, and considerable development is anticipated.

Fire at the Heinze smelter at Butte, Mont., on April 19 caused damage estimated at \$200,000. The boiler and engine rooms, together with the matte and sampling departments, were entirely destroyed, and the ore chute and tramway badly damaged.



## A Chicago and European Steamship Line.

On April 24 the first steamer that will begin to ply regularly between Chicago and European ports will leave the Chicago harbor. The steamer "Northwestern" of the Northwestern Steamship Company will on that date start for Hamburg with a load of miscellaneous freight which will include 300 harvesting machines that have been sold to the farmers of Germany. There will also be several hundred barrels of flour. Leaving Chicago the steamer will load to a depth of only 12 feet, on account of the depth of water in the Canadian canals, but will finish her cargo and coaling at Montreal for the ocean voyage. She is scheduled to make the round trip between Chicago and Hamburg in 60 days. This will allow ample time for loading, &c., as her sailing time will be only 23 days each way. She will run regularly between Chicago and Europe during the summer months, and put in her time in the winter as a tramp steamer on the Atlantic, returning next spring to her regular work for the Chicago company, who are the first to own a direct steamer line between this city and Europe.

The "Northwestern" is fitted with triple expansion engines and with a freight capacity of 3200 tons. She is 256 feet long, has a beam of 42 feet and a draft when loaded to her water line of 21 feet. Her estimated speed is 15 knots an hour. She is built of steel, and has three water tight compartments. The other vessels of this line are the "Northman," which leaves Chicago, April 25; the "Northeastern," which leaves about May 1, and the "Northtown" about May 15. All are of the same dimensions, and have the same equipment.

What a Chicago shipbuilding yard can do in the way of rush work is capably illustrated in the labor the Chicago Shipbuilding Company have performed upon these four vessels. The order for their construction was given about October 1 last year. The contracts called for the delivery of the boats to their owners on or before April 15, although allowance was made for a possible two weeks' delay as to this.

The "Northwestern" was launched December 29, and the other vessels followed in quick order, making a record for the shipbuilding company of which they may well be proud. Manager John A. Ubsdell, Jr., is as much to be congratulated on this speedy work as any one connected with the company, as his eye has been constantly upon the progress of the quartette, and he has spared no effort to deliver them promptly on the opening of the navigation season. The yards of the company are at 101st street and the Calumet River, and the forty-seventh vessel built there—the "W. L. Brown"—is now rapidly nearing completion.

Charles Counselman of Charles Counselman & Co., Chicago, who planned the Northwestern Steamship Company and incorporated them under the laws of New Jersey, said, in speaking of the project, that he felt sure it would revolutionize the freight traffic between Chicago and foreign countries. In explaining his plans, he said: "The boats will run between Chicago and all European ports. Later they may go to South America and Africa. They will make Chicago their home harbor during the open season of navigation on the great lakes, and in winter will ply as tramp steamers on the Atlantic. I believe that direct trade between Chicago and foreign cities may be promoted, and that it will pay well on the investment. Grain may be taken on here and never handled until it is unloaded, while under the present system it is loaded at the shipping point, handled again in this city, still again at the seaport, and unloaded at its destination. With our line we will be able to send a cargo of grain to Liverpool, and if the market looks better in Hamburg we can proceed to that port without delay. Western shipping men are with me in the opinion that goods can be brought here from Europe without breaking bulk. The saving in handling freight and the lessened cost of bringing it from Eastern cities should make the thing profitable, for there is a considerable difference between the cost of shipping goods from Liverpool direct and sending them to some Eastern seaport, putting them on trains and having the railroads haul them out here. So I

think Chicago will soon note a big increase in her own exports, the figures which formerly have been added to the exports of the seacoast cities being placed to this city's credit. The establishment of an ocean going fleet in this city is a harbinger of the deep canal which soon must connect the lakes. I believe, also, that it will be an argument for a canal for deep water vessels between Chicago and the Mississippi River, and this I expect to see within a few years."

## The McKeesport Strike.

The strike started about a week ago by members of the Amalgamated Association of Iron, Steel and Tin Workers in the W. Dewees Wood Company of the American Sheet Steel Company, at McKeesport, Pa., has been declared off. The plant was to have started up Monday morning, April 22, in full, but owing to the fact that the Monongahela River had overflowed its banks it is probable that the plant will not be running until about the middle of this week. The trouble at this works started over the fact that a lodge of the Amalgamated Association was being organized among the employees. Samuel G. Cooper, manager of the plant, discharged five or six men for joining this lodge, and upon a demand from the Amalgamated Association that they be reinstated at once, refused to do so, with the result that the rest of the men went out on strike. The Wood Works have always been non-union, and when the sheet scale was signed last summer it was the understanding that the Wood plant was to remain as it was until the regular scale settlement on July 1 of this year. The action of the Amalgamated Association in trying to organize a lodge was construed by the management of the plant as a violation of contract, and for this reason the men were discharged. Under the terms of the settlement of the strike the Amalgamated Association is to make no further efforts to organize a lodge in the works until after the present scale expires, and in consideration of this the management have agreed to take back all the men who were discharged, with the exception of one man. An official statement of a settlement of the trouble has been given out as follows:

"We have discovered after a careful examination of the points at issue that, as usual, mistakes and misunderstandings underlie the trouble at McKeesport, and we reach the conclusion that it will be to the advantage of all parties concerned to start the Wood mill with the old employees next Monday, April 22, 1901.

"And it is further agreed that the contract with reference to working conditions in the mill and scale matters shall be observed until July 1, 1901, and in the meantime Mr. Smith and Mr. Holloway shall have a meeting to adjust any difficulty which may exist between them.

"T. J. SHAFFER,  
President A. A. I., S. & T. W.  
"JOHN WILLIAMS,  
Secretary Treasurer A. A. I., S. & T. W.  
"JOHN JARRETT,  
"American Sheet Steel Company."

The Sharon Steel Company, Sharon, Pa., have recently purchased a large amount of ore through Pickands, Mather & Co., Cleveland, Ohio.

Henry G. Morse and H. C. Frick of the New York Shipbuilding Company are credited with having purchased 650 acres of land at Paulsboro on Montana Creek, a tributary of the Delaware River. It is surmised that it is the intention to build a large forging plant.

The Export Shipping Company of New York are shipping in the first part of May, on the steamer "Laura," 3000 tons of iron pipe and 1000 tons of general cargo for Dutch East Indies.

# The Iron Age

New York, Thursday, April 25, 1901.

DAVID WILLIAMS COMPANY,	-	-	-	-	-	PUBLISHERS.
CHARLES KIRCHHOFF,	-	-	-	-	-	EDITOR.
GEO. W. COPE,	-	-	-	-	-	ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS,	-	-	-	-	-	HARDWARE EDITOR.
JOHN S. KING,	-	-	-	-	-	BUSINESS MANAGER.

## The Balance of Trade Settlements.

A year ago the late Mr. Mulhall calculated that in 40 years British imports of merchandise had exceeded exports of merchandise by £3,681,000,000, during which period Great Britain had imported £123,000,000 of the precious metals more than it had exported. For the last ten years the excess of imports of merchandise had averaged over £133,000,000 per annum and the excess of imports of precious metals had averaged £4,500,000. The excess of imports of merchandise was gradually increasing and in 1899 it amounted to £155,400,000. Mr. Mulhall believed that the earnings of British shipping in 1898 were £54,000,000 and that British earnings on £1,900,000,000 invested in foreign countries amounted to £95,000,000, which two sums make £149,000,000, which paid for the excessive imports.

The catalogue of the German exhibit at the Paris Exposition contains a survey of the condition of the German Empire, the foreign trade statistics of which show constantly an adverse merchandise balance. For the four years 1895-8 these adverse balances amounted to well over \$1,000,000,000. Twenty years ago the imports and exports exactly balanced; ten years ago the imports were 87 marks and the exports 69 marks per capita; in 1898 the imports were 100 and the exports 74 marks per capita. Dr. von Halle, author of this survey, estimated the earnings of German shipping at \$75,000,000 a year, and cited a computation that German investments over seas amounted to \$1,875,000,000, 5 per cent. interest on which would be \$93,750,000. The two items would go far toward settling the adverse balance on merchandise, but alone they would not be sufficient to offset such balances as those from 1895 to 1898. But German investments in Russian enterprises and in Russian bonds, and other investments on the Continent of Europe, are not included in this summary of investments over seas. It will be observed that so far as these figures are to be followed, German investments abroad are greater than the British, for German investments beyond the sea are nearly equal to the figures given for British investments all over the world. In view of British investments in India and Australia, and the very large amounts that have been invested in the United States and South Africa, and, in fact, all over the world, one may hesitate to accept this inference. Probably the British figures are too low or the German figures are too high.

These two countries, whose resources not already exploited afford but limited investments for their growing wealth, import more merchandise than they export and settle the balance with the earnings of their carrying trade and their foreign investments. The United States, with vast resources awaiting development, and opportunities for investing all capital accumulated at home, and a great deal of foreign capital also, exports more merchandise than it imports, and takes pay for the excess in ocean transportation and in capital invested here. In 30 years the United States exported \$22,791,000,000 worth of merchandise and imported \$19,-

493,000,000 worth. The excess of exports of merchandise was \$3,298,000,000, to which should be added a net export of \$499,000,000 worth of silver, making altogether an excessive exportation of \$3,797,000,000 worth. Of late there has been a net importation of gold, but for the whole 30 years there was a net export of gold amounting to \$148,000,000, according to a review of our foreign trade published in the *Journal of Commerce and Commercial Bulletin* a year ago. This makes a total excess of exports of merchandise, silver and gold from 1870 to 1899 of \$3,945,000,000, an annual average of \$131,500,000. This average does not by any means represent recent years, in which the excess of exports of merchandise has been enormous, and there has been only a small offset in the gold imports. But this excess of exports has gone to pay for ocean transportation, the expenses of travelers in Europe and the American funds drawn by rich Americans, particularly women married to foreigners, which has been estimated to amount of late years to not less than \$10,000,000 a year, interest and dividends on the investments of foreigners in this country, and the discharge of our indebtedness to Europe effected by purchases here of American bonds held abroad. Since 1896 this has been very great; Americans have been eager to buy back their properties and Europeans have been pretty willing to sell on a rising market, partly because for one reason and another money has been in pretty sharp demand on the other side, and partly because a good many European investors had been disappointed before 1896 with their American investments and were willing to dispose of them when the restoration of confidence on this side made it possible to do so on favorable terms.

## Queer Legislation Attempted in Illinois.

Serious efforts are being made to pass a bill through the Illinois Legislature prohibiting "the insurance or indemnification of persons or corporations against loss or damage resulting from accident to or injury suffered by an employee or other person." The intention of the bill, in plain language, is to prevent all employers of labor engaged in hazardous business from insuring their employees in employers' liability casualty insurance companies. The member who introduced the bill, in a speech supporting it, claimed that the insurance system conduced to carelessness, both on the part of the workers because they are insured and on the part of the corporations because they are protected, and further argued that it forced upon injured employees settlements which work much hardship. This line of reasoning, if exclusively maintained, would have made the bill appear to be conceived for disinterested purposes, with the public welfare as the main consideration. Even then, the proposition would have contemplated a step backward, as the insurance feature is regarded by those who have adopted it as a most satisfactory arrangement, working equitably between employer and employed, saving much annoyance to the former and likewise greatly reducing the amount expended for damages. In recent years prosecutions for damages have multiplied amazingly. Suits for damages are brought on the slightest pretext, and if the employing party should be a corporation with a fair capital a jury will usually award ample compensation to help along "the poor man fighting the rich company."

Those who are using casualty insurance state that they have found that the attorneys regularly employed by the insurance companies have acquired such a degree of experience in handling the cases coming before them for disposal that they are enabled quite speedily to determine the real merits of each one and thus secure



much better settlements than could be effected by a lawyer inexperienced in business of this character. The retention of such lawyers appears to be the real reason for the attempted passage of this bill. The business of numerous local lawyers who bring personal damage suits is seriously interfered with. They find that contesting a suit with a man familiar with all the points likely to arise and trained in the business of developing overdrawn injuries is a very different matter from trying one with an opponent not versed in the arts employed in personal damage litigation. This point has been exposed, and probably may lead to the defeat of the bill, as it is thus clearly shown to be inspired for the benefit of a certain class and not for the public welfare.

### A Severe Chicago Verdict.

Illinois manufacturers are profoundly agitated over the case of Henry Baster. He was employed as foreman by a Chicago manufacturing company, and some months since, when waylaid by a party of strikers, shot and killed one of them in self defense. Last week he was tried and convicted of murder and sentenced to the penitentiary for 14 years, the sentence under the laws of Illinois being fixed by the jury. It is claimed that the jury's decision was unjustifiable, as the convicted man was clearly shown to have been attacked without provocation, at a remote distance from the plant, and would have been severely injured if not killed had he not been armed. The decision under such circumstances is regarded with apprehension, as tending to indicate that the sympathy of the people of Chicago is largely with striking workmen, even if they resort to violence to endeavor to carry out their purposes. It is stated that the company directly interested will supply the funds to appeal the case to the highest courts if necessary and that numerous other manufacturing concerns have professed their assistance if help is needed.

The city of Chicago has of late years been acquiring a reputation for permitting outrages to be committed ostensibly in the cause of labor, and this verdict has capped the climax. It indicates that the city authorities have pretty accurately gauged public opinion in winking at lawless acts when claimed to be perpetrated in the sacred cause of protecting or advancing the rights of labor. The taking of human life is deplorable, but even in savage communities it is deemed justifiable when done in self defense. Chicago juries are ordinarily disposed to be lenient, erring on the side of mercy to the accused, and the severity of this sentence is to be clearly attributed to the ingrained belief in the minds of the men composing this particular jury that a striking example should be made of a man who had the temerity to beat at his own game a ruffian who was introducing murderous methods into a labor dispute. The case will undoubtedly receive very careful consideration on appeal, and if another jury trial should be granted the result will be awaited with great interest.

Informal conferences are being held this week at the offices of the Amalgamated Association of Iron, Steel and Tin Workers, in the Bissell Block, Pittsburgh, as to the new wage scale to be drafted for the annual convention of this organization to be held in Milwaukee, commencing May 21. The Wage Committee will meet in Milwaukee May 15 to finally arrange the scale and have it ready for presentation at the regular convention.

All records were broken on the New York Stock Exchange on Friday, when no less than 2,172,600 shares were dealt in, the public figuring largely in the market.

## The National Standardizing Bureau.

### Director Stratton's Plans.

WASHINGTON, D. C., April 23, 1901.—Director Stratton of the new National Standardizing Bureau, authorized by special act during the last session of Congress, will sail for Europe in about a fortnight to inspect the leading physical laboratories and similar scientific institutions of England, France, and Germany, for the purpose of noting the very latest developments in equipment, methods, scope, &c., with a view to making the complete installation of the new bureau equal if not superior to any similar institution in the world. The Government is now negotiating for a four acre tract of land located in the suburbs of Washington conveniently to rapid transit, and architectural plans are already in course of preparation, it being the purpose of Director Stratton that this feature of the work shall be completed during his absence. Upon his return the plans will be revised and ground broken for the new building without delay. Within less than a year, if the present designs are executed, the building will be finished and equipped for the performance of the most important functions of the bureau with special reference to the standardizing of all kinds of apparatus for private manufacturers. With regard to the special line of investigation which he will pursue while abroad, Director Stratton said to the correspondent of *The Iron Age*:

"I shall go first to England, and will there inspect the British National Physical Laboratory, the Standardizing Laboratory of the Board of Trade, the physical laboratories of the most important educational institutions and Kew Observatory. In France I will, of course, visit the International Bureau of Weights and Measures which has charge of the distribution of the standards of the metric system throughout the world, and will also inspect the principal physical and technical laboratories. In Germany, I shall devote a good deal of time to the famous Reichsanstalt and to the Normal Aichung Commission, which is the equivalent of our Bureau of Weights and Measures. I will also inspect the important Astro-Physical Laboratory at Potsdam, and the physical laboratories at several of the leading universities. In all these countries I will give special attention to the equipment and methods of testing laboratories.

"An important feature of my work abroad will be to ascertain the methods employed in the several countries visited to make the work of standardizing valuable to the great iron and steel industry. In Germany, especially, the Reichsanstalt has performed work of the greatest value to the iron and steel manufacturers, and we wish to learn just how this has been done with the hope of improving upon it if possible. As an illustration of the value of this great institution in Germany the fact might be cited that recently at the famous Krupp works a problem was encountered so perplexing that it was referred to the Reichsanstalt, which, instead of undertaking to develop a theory at long range, promptly sent its most expert specialist to the Krupp works with instructions to remain there until the difficulty was solved. It hardly need be said that such service is invaluable, but I trust that in a few years we may be in position to do as much for American manufacturers.

"The subject of high temperatures is a most important one in steel making and is one to which I shall give a great deal of attention while abroad. It is my expectation that when our scientific force is organized one of our most competent men will be a specialist in pyrometry. I hope to be able to bring back authentic information with regard to a number of subjects upon which we have more or less incomplete information, as, for example, the matter of the uniformity of screw pitch, which has been the subject of a good deal of agitation in Germany. It will not be the purpose of our bureau to suggest standards for screw threads, but simply to ascertain what the world at large is doing, and in case our manufacturers should adopt a uniform standard to assist them in promulgating and preserving standards, in distributing gauges, templates, &c., and in comparing



them from time to time with the official standards in the custody of the bureau.

"Modern laboratories at big steel works are so complete in all details that these institutions will be interested in almost every branch of our work in addition to that which relates especially to manufacturing processes. We will be in position to standardize and calibrate all the philosophical apparatus of a large chemical laboratory, to standardize the weights of testing machines, to test weights for all kinds of scales, to standardize rules, tape lines, &c., and in a general way to assist in spreading scientific uniformity through every department of the great iron and steel industry. This, of course, is an ambitious programme, and cannot be realized at once, but it will be the mark toward which the bureau will constantly strive."

The Secretary of the Treasury within a few weeks will appoint a visiting committee to consult with the Director of the new bureau on important matters of equipment, practice, &c. The iron and steel industry will be represented by a prominent chemist attached to one of the leading steel works of the country, and an equally eminent electrical expert will represent that industry. In this way the institution will enjoy the advantages to be derived from the advice of men who not only possess high attainments in the scientific world, but who in addition are thoroughly practical. W. L. C.

### The National Tube Company.

We have already noted the fact that at a meeting of the Board of Directors of the National Tube Company, held in New York City last week, the resignation of a portion of the executive officials of the company took place. This made a reorganization necessary, which has been effected as follows:

F. J. Hearne, president, in general charge of all the affairs of the company.

W. B. Schiller, first vice-president, in charge of the manufacturing department.

W. H. Latshaw, second vice-president, in charge of the mercantile department.

J. D. Culbertson, third vice-president and treasurer, in charge of the financial department, with headquarters temporarily in the Havemeyer Building, New York, but later at the Conestoga Building, Pittsburgh, Pa., of which due notice will be given later.

A. S. Matheson, fourth vice-president, in charge of the foreign department, with headquarters at the Havemeyer Building, New York.

The duties of the treasurer were combined with those of the third vice-president and the position of general manager was abolished. All of the offices of officials heretofore maintained in the Havemeyer Building, New York, will be removed to the Conestoga Building, Pittsburgh, Pa., except that of the fourth vice-president.

The sales offices of the New York sales agency and of the foreign department will be continued as heretofore in the Havemeyer Building, New York.

**Wm. Jessop & Sons, Limited.**—After looking over a number of sites in Western Pennsylvania and Eastern Ohio, particularly in the Pittsburgh and New Castle district, the representatives of Wm. Jessop & Sons, Limited, of Sheffield, England, have bought a site of land at Washington, Pa., containing 38 acres, on which the concern will build a crucible steel plant. The land is said to be advantageously situated, and is near the plant of the Tyler Tube & Pipe Company. It is probable the initial plant will be of moderate size, but will be made larger later on. Engineers are now engaged in drawing plans for the plant, and active work of construction will commence in a short time. It is probable that nearly all of the equipment of boilers, engines, rolling mills, electric and other machinery will be bought in Pittsburgh. A small part of the equipment will be brought over from the other side. The firm of Wm. Jessop & Sons, Limited, were established in Sheffield, England, in 1774, and their steel is favorably known all over the world. The concern have had a large trade in America

for many years, and in order to better take care of it, and increase it, the firm have decided to build a plant on this side. The output of the new works will be high grade crucible tool steel.

### Central American News.

**SAN BENITO, CHIAPAS, April, 1901.**—With the coming of the new liners between Central American, Mexican and American ports on the Pacific, this port is beginning to take on new life. It is now proposed to rebuild the pier and make an iron and steel wharf of it throughout. This is most necessary along this Southern coast, as the surf beats with tremendous force, often rising 25 and 30 feet over the rocks. The new pier will have to be something over 300 feet long to be of service to the ocean steamers stopping here.

Through San Benito and Tepachulo a large trade in hardware, iron and steel goods can be developed on the northern border of Guatemala and in all the Southern Mexican States of Chiapas, Soconusco, Guerrero and Tabasco. This section is extremely rich in natural products, especially coffee, spices, lumber and gold, copper and lead mines. The latter have not been developed above the miner's "gophering" style, seldom reaching a depth of over 45 or 50 feet.

Toward the spurs of the Sierra Madre the copper leads are well defined and broad, often having an assay value of 60, 75 and 80 per cent. in carbonates and oxides principally. The Mexican mining laws are liberal and just, and there is relatively little litigation where properties have been honestly worked. Should the Greene syndicate of New York purchase the Cuernavaca & Pacific Railroad it will probably be a matter of but a year or so when an all rail line will reach Chiapas and Soconusco via said line from the borders of the United States. This would then naturally cause the gap to be closed from Tapachula to Guatemala, and the three American railroads would then be fairly started on their course toward Buenos Ayres and Valparaiso, South America.

The saying, "In time of peace prepare for war," might easily be applied to business matters as well. It surely would be good policy, now in our times of prosperity, to prepare for any future crisis at home by studying and extending our commerce with those 16 different Spanish-American nations to the south of us. Their aggregate imports and exports yearly of some \$600,000,000 in value are certainly worth trying for; all the more so when we think of the fact that to-day we get a bare 10 per cent. of the total, all the rest going to European countries—England, Germany and France mostly. It is therefore most unfortunate that we should have got into this squabble just at this time with Venezuela. When in that country during the Guiana trouble of Venezuela and Great Britain I predicted that our representatives at Caracas would have to be men of wide experience and knowledge to keep us in friendly relations with the Venezuelans. Like most Latin Americans, they should be dealt with in a just, kind and strong manner. Our consuls and ministers should not only investigate complaints of those who have "backing," but, however poor and forlorn an American citizen might be, his case should be looked into thoroughly, thus bringing into existence a very healthy respect for everything American. At the same time these people are very quick to resent any injustice, especially if at the hands of a more powerful neighbor; then there is the element of sentiment, which is a very large factor in their composition. For instance, a commercial traveler can do more with them by speaking their language fluently (Spanish), studying their habits and business ways than in any other manner. Now it is true that large quantities of low grade German and British goods find their way to the South and Central American markets, but I can vouch for the discrimination on the part of Latin Americans in judging quality. Once they are convinced that an American saw or chisel or machine or locomotive is superior in quality of metal and workmanship to a cheaper but low grade European article, then they immediately pay the difference and purchase from then onward. A very great advantage of these markets is that they are

conservative, and American manufacturers can count on their orders for a quarter of a century or more, year after year, well satisfied with having proved once for all that they are dealing with honest men for honest goods.

### United States Steel Corporation Coke Properties.

As noted in these columns last week, Thomas Lynch, president of the H. C. Frick Coke Company, has been made general manager of all the coke properties of the United States Steel Corporation. These include all the coke works of the H. C. Frick Coke Company and those of constituent interests of the United States Steel Corporation. The plants in the Masontown field owned by subsidiary companies are all large ones. The Eureka Fuel Company, who are owned by Federal Steel Company, have three 500-oven plants at Leckrone, Footdale and Buffington. The latter works are not completed yet. Another 500-oven plant had been projected by the Eureka Company on the outskirts of Masontown, but whether or not these plans will be carried out is not known. The American Coke Company, the coke and coal interest of the American Steel & Wire Company, have three plants, Edenborn and Lambert with 500 ovens each, though the latter works are not completed, and Gates, which produces coal alone. The Continental Coke Company, organized by the National Steel Company, have three plants in the southern end of the Connellsville region, each of 300 ovens, and located so that they can easily be increased to 500 ovens each. Besides these ovens the American Company own the Baggaley works of 400 ovens in the northern end of the Connellsville region and Dorothy with 300 ovens in the Latrobe district. The Federal Steel Company own the Southwest Connellsville Coke Company ovens, in all 1233. The National Steel Company own the Marguerite works, with 400 ovens, in the northern end of the Connellsville district. The United States Steel Corporation have 5733 ovens, in addition to 13,500 owned by the H. C. Frick Coke Company, giving that concern a total of more than 19,000 coke ovens. Of the 5733 ovens taken over, 2933 are in the Connellsville district and 2800 in the Masontown and Latrobe districts.

### Changes Among Reading Iron Company Officials.

A circular letter sent out by Vice-President and General Manager F. C. Smink of the Reading Iron Company announces the following appointments: George Schuhmann to be general superintendent, with general supervision of physical operations of all the plants of the company; Jesse I. Boyer, superintendent of Scott Foundry department; David Thomas, superintendent of Montour Rolling Mills department, Danville, vice Theo. F. Patterson, resigned; John M. Callen, purchasing agent; George F. D. Hallman, assistant purchasing agent. Mr. Schuhmann, who becomes general superintendent of the company, was superintendent of the Scott Foundry. Mr. Boyer, who succeeds Mr. Schuhmann as superintendent of the Scott Foundry, was formerly assistant superintendent of those works. Mr. Thomas, who will become the superintendent of the Danville works, is at present the assistant superintendent at that place. Mr. Callen, who becomes purchasing agent, was the auditor of the company. Mr. Hallman, who becomes assistant purchasing agent, was a clerk in the company's offices in this city. The latter two positions are new offices.

**Pittsburgh Freights.**—Rail and lake freight rates and differentials from Central Traffic Association territory to the Northwest were checked up in Pittsburgh last week at a joint meeting of the freight committees interested. On the whole the new rates are higher than those of last year, this being due to the recent increase of lake rates. Removal of the pro rata basis with the lake lines and the substitution of the sums of local rates were the main action taken at the meeting. This action was caused by the raise in lake freights. The meeting was the annual one for checking in the differentials for the coming season of lake navigation, opening April 22.

The cities affected are those on Lakes Huron, Michigan and Superior that obtain their freight from this territory, partly by water from points on Lake Erie. St. Paul and Minneapolis are also included in the scope of the meeting.

### New Publications.

**INVENTORS' MANUAL.** Published by Norman W. Henley & Co., New York. Price \$1.

Although somewhat disjointed and not arranged in logical sequence, the matter brought together by the anonymous author of the *Inventors' Manual* contains much that will prove of service to those who desire to market an invention. Some very good advice is given in plain, straightforward language. We note in particular the warning of the danger of making an assignment of an undivided interest in the patent and the advice to perfect an invention before bringing it to the notice of promoters or capitalists. There are good chapters on joint ownership, territorial grants, selling agents, &c. The principal requirements of the leading foreign patent laws are presented and also a series of blanks for applications, &c. While certainly not pretentious, the little volume contains much that is of value to beginners.

**THE MANUAL OF STATISTICS.—STOCK EXCHANGE HANDBOOK, 1901.** Published by Charles H. Nicoll, New York. Price \$5.

The twenty-third annual issue of the "*Manual of Statistics*" has just appeared. Naturally, through the augmentation in the number for industrial corporations, it has been greatly enlarged. The "*Manual*" takes up only corporations whose securities are dealt in at the stock exchanges of the country. It gives information relating to their property, earnings, &c., and embraces railroad securities, Government securities and industrial, banks and trust companies, street railway companies, the high and low quotations of stocks at the New York, Baltimore, Boston, Chicago, Cincinnati, Philadelphia, Pittsburgh, Montreal, Toronto and other exchanges. There are also miscellaneous statistics relating to coal, corn, produce, cotton, silver, wheat and mining. A considerable number of maps accompany the reports relating to railroads. The volume is handy and apparently accurate.

**DIRECTORY OF DIRECTORS, 1901.** Published by the Audit Company of New York. Price \$3.

Last year the Audit Company issued their first annual, modeled after the "*London Directory of Directors*," now in its twenty-first year. It gives a list of the men who are directors in important corporations, and in that respect the new edition is an elaboration of the first. It has been enlarged, however, by an appendix containing the names of the principal corporations of New York, with the list of the officers and directors.

The first of the new type of 5-inch naval guns, designed for cruisers of the "*Denver*" class, was tested recently at the Government proving grounds at Indian Head, with very satisfactory results. A projectile weighing 60 pounds was fired with a powder charge of 26 pounds. The muzzle velocity reached the exceptionally high figure of 2990 feet per second, showing a muzzle energy of 3724 foot tons. This is 65 per cent. more muzzle energy than guns of the same type have made heretofore. It is sufficient to pierce 7 inches of Krupp armor at the muzzle and 5 inches of Krupp armor at 2000 yards.

Thirty-seven representative business men, members of committees appointed by the Chamber of Commerce and the Merchants' Association of New York City, left on Saturday for Texas. They go there at the invitation of the Governor and State Legislature of Texas, and will travel over the State until May 9, investigating existing conditions with a view to arranging for closer business relations between Texas and the East.



## The Sharon Steel Company.

Frank H. Buhl has resigned as president of the Sharon Steel Company and G. W. Darr of the Pittsburgh firm of bankers and brokers, Darr & Moore, has been elected to fill the vacancy. This has been interpreted as proof that the Sharon Steel Company are to be acquired by the United States Steel Corporation, Mr. Buhl having been outspoken in his determination to conduct the plant as an independent one. We are advised, however, on the best of authority that the Sharon Steel Company have not yet received any offer whatever for the control.

The Sharon Steel Company were organized by men who have long been closely identified with the iron and steel interests of the Shenango Valley, certain Pittsburgh capitalists co-operating with them. The plans were laid on very broad lines. Ore property was acquired in the Mesaba range and has been rapidly developed. Coal property is controlled to form the basis of a large by-product coke oven plant, for which plans are being drawn. A sufficient number are to be erected to insure a full supply of coke and make the plant independent of the Connellsville region.

A modern blast furnace is approaching completion. It is 22 x 100 feet, equipped with four stoves 110 x 20 feet. The furnace is expected to produce 600 tons of pig iron daily. The company have nearly finished a basic open hearth steel plant, containing eight 50-ton basic open hearth furnaces. It is equipped with soaking pits, electric cranes and all other modern appliances. This plant should turn out 800 tons of steel per day. It is the intention later on to use molten metal from the blast furnace, and this ought to increase the output of the steel plant to 1000 tons daily.

The company are building two Morgan continuous rod mills, to have a combined capacity of 400 tons of rods per day. These rod mills will be modern throughout, the continuous heating process being employed. Wire mills large enough are being built to draw all the rods, and a sufficient number of wire nail machines are being installed to turn out 4000 kegs of wire nails per day.

The Sharon Tin Plate Company, an identified interest of the Sharon Steel Company, will have a total of 20 tin mills. Ten of these mills are about finished and the other ten are being completed as fast as possible. The company have sold the output of ten of these mills for five years to the American Tin Plate Company.

Recently the Sharon Steel Company let contracts for a skelp mill, to roll 450 to 500 tons of skelp daily. This entire product will be used in the manufacture of tubes, which the Sharon Steel Company will be prepared to make from  $\frac{1}{4}$  to 14 inches in diameter. Contracts for the building for the skelp and tube mills were given to the American Bridge Company recently.

An engineering feat was accomplished on Sunday morning when the old draw of the Lackawanna Railroad over the Passaic River at Newark, N. J., was removed and a new one, much larger and heavier, was put into place. The work was done in 1 hour and 35 minutes. The new draw, built entirely of steel and weighing 850 tons, was put together in the river near the bridge. When it was completed a portion of the truss work was knocked away, scows were floated into the place and the mass was allowed to rest upon a false structure, with the scows as a base. Scows were floated under the old draw, which was detached from the main bridge and quickly moved away. Meanwhile the new draw was floated down stream and secured in place, when the scows were floated away, the whole operation occupying but 1 hour and 35 minutes.

It is stated as a probability that the New York Air Brake Company will erect a plant in Russia for the manufacture of air brake appliances for the Russian Imperial Railways. The Russian Minister of Railways has decided that all railway equipment must be fitted with air brakes, which means an expenditure on these appliances of about \$20,000,000.

## OBITUARY.

RICHARD P. ROTHWELL.

Richard Pennefather Rothwell, editor of the *Engineering and Mining Journal*, and a prominent mining engineer and writer on industrial subjects, died on April 17, at his home in New York City, of cancer of the stomach. He was born at Ingersoll, Ont., Canada, May 1, 1837. After studying at Trinity College, Toronto, he took a course in civil engineering at the Rensselaer Polytechnic Institute at Troy, N. Y., where he was graduated in 1858. He then took a three years' course at the Imperial School of Mines in Paris, and then entered the Mining Academy at Freiberg, Saxony. Returning to this country in 1864, he followed the profession of mining engineer for a number of years in Pennsylvania. In 1873 he came to New York and soon after became connected with the *Mining and Engineering Journal* in an editorial capacity. Mr. Rothwell was one of the founders of the American Institute of Mining Engineers at Wilkes-Barre, Pa., in 1871, and in 1882 became its president. He was a member of a number of foreign scientific and technical bodies.

### NOTES.

SYLVESTER N. LEARY, proprietor of the Columbian Foundry, at Greenpoint, New York City, died on April 20, at Atlantic City, N. J., aged 34 years.

JOHN C. PORTER, JR., president of the Porter Foundry & Machine Company, Pittsburgh, Pa., died April 11, at his home in Allegheny, aged 66 years. Mr. Porter had been an invalid for a number of years. He was born in Allegheny County, and took employment as a machinist. During the Civil War he served three years in the army of the Potomac. Subsequently he founded the company who bear his name.

HENRY HERBERT LUSCOMB, secretary and superintendent of the Johns-Pratt Company of Hartford, Conn., died April 15 of pneumonia after a brief illness.

JAMES E. BERRYMAN, a well-known boiler manufacturer at 125 North Fourth street, Philadelphia, Pa., died at his home in Gloucester City, N. J., April 13. Mr. Berryman was in his fifty-ninth year.

JOHN W. HINTON, for many years widely known as a writer on tariff questions from a protection standpoint, died April 19 at his home in Milwaukee, after an illness of four months. Mr. Hinton was 84 years of age, and up to his last illness was rugged and vigorous. He was quite wealthy, from a fortune left him by his son, Francis Hinton, long connected with the North Chicago Rolling Mill Company and the Illinois Steel Company, who died in Paris some years since. Mr. and Mrs. Hinton gave the Protestant Home for the Aged \$50,000 for a fire proof addition to the home that was completed last year. The gift was in memory of their son. He was an Englishman by birth and for many years was a seaman. When he first went to Milwaukee he served as city editor on local papers. Later he established the Northwestern Tariff Bureau and published and circulated pamphlets and articles upholding the doctrine of a high tariff.

CHARLES W. MILLER, president of the Phoenix Horse Shoe Company, of Poughkeepsie, N. Y., and Joliet, Ill., died April 18, at his home, 3 East Seventy-sixth street, New York, from a complication of diseases, aged 70 years. He was born in Central New York, and in the early fifties went to California, where he became a partner in the firm of Huntington, Hopkins & Co. He returned to the East about 25 years ago.

D. J. MCKENZIE, superintendent of one of the departments of the Dominion Iron & Steel Company, at Sydney, Cape Breton, was accidentally killed on April 14. Mr. McKenzie was a native of Boston.

Many reports are current as to the details of the personnel of the management of the United States Steel Corporation. We are advised officially that these reports are largely guess work, since actual appointments have not yet been made.

## MANUFACTURING.

### Iron and Steel.

The Diamond State Steel Company of Wilmington, Del., are contemplating the building of a new train for rolling small billets and the larger sizes of bars.

The Youngstown Iron Sheet & Tube Company have broken ground for their new plant at Youngstown, Ohio, and work on the erection of this plant will be pushed as fast as possible. The officials of the company are George D. Wick, president; J. A. Campbell, vice-president, and W. C. Riley, auditor. The company are capitalized at \$1,000,000, and expect to have their works in operation in the fall. They will make tubes and sheets out of iron exclusively.

The Altoona Iron Company, Altoona, Pa., manufacturers of refined bar iron, are erecting a new ore house, machine and blacksmith shops, stable and office buildings, to take the place of the old frame buildings, which have become dilapidated and unfit for service. These improvements will cost about \$15,000.

The Empire Iron & Steel Company have blown in No. 2 Furnace at Reading, Pa.

A large steel forging plant will be constructed about 3 miles above Chester, Pa., on the Delaware River, near Billingsport, N. J. Edward W. Mellon, Henry C. Frick and John A. Potter of Pittsburgh, Pa., and George G. Morse of Camden, N. J., are behind the project, and the correctness of the report is vouched for by Mr. Mellon. John A. Potter, formerly superintendent of the Carnegie Works at Homestead, Pa., is to be manager of the new plant, which, he says, will be the largest plant of its kind in the world, and will represent an outlay of nearly \$3,000,000. The tract purchased comprises 700 acres and is in close proximity to the New York Shipbuilding Company, some of whom are interested in the new steel plant, so both concerns will be operated in complete accord, the one supplementing the other.

The statement that the Monongahela Mfg. Company, Monongahela City, Pa., would build a new plant and go into the manufacture of wire nails is untrue. This concern manufacture a high grade of haulage and hoisting engines, and their business has been established for 18 years. The concern have no intention of going into other lines.

It is reported on good authority that the John Wales Company of Boston, Mass., have purchased the plant at Auburn, R. I., formerly operated by the Corliss Safe Works before they were absorbed by the Mosler Safe Company of Ohio. The land covered by the plant covers 11 acres, upon which are large and well lighted buildings perfectly adapted for the manufacture of steel rods and wire nails, which the new owners intend making. The plant will at once be fully equipped with up to date machinery and will be operated by the purchasers under the style of the John Wales Wire Company.

Fannie Furnace, at West Middlesex, Pa., recently bought by the Cherry Valley Iron Company, Murtland Building, Pittsburgh, will be started up on mill iron. The furnace is now being overhauled and will be put in blast in a short time.

In one week recently the Sparrow's Point Works of the Maryland Steel Company rolled 5018 tons of 50-pound rails for a Norwegian railway, and 1832 tons of 4-inch billets, making a total output for 5½ days of 6850 tons of finished product. It is the best week's work on record at this plant. During the same week the converting mill turned out 7755 tons of ingots.

The Summit Wire Company, Cuyahoga Falls, Ohio, are making a number of improvements at their works, which will give them a larger output. It is the intention of the company to use water for power, and arrangements are now being made to utilize the falls near their works.

The Dover Furnace, at Bear Spring, Tenn., has recently been put in operation on cold blast charcoal pig iron, for chilled rolls, by the Dover Iron Company, composed of Graham McFarland, H. L. Williams and R. B. Hickman of the firm of Hickman, Williams & Co., and their associates. They have found quite a demand for this grade of iron.

The employees of the tube mill of the Tyler Tube & Pipe Company, at Washington, Pa., have been on strike for more than a week, and the plant is closed in all departments. At present it does not seem that there will be an early settlement of the trouble.

L. D. Castle, formerly with the Kelly & Jones Company, at Greensburg, Pa., is connected with a project for the building of an iron and steel plant in or near Greensburg.

The St. Clair Steel Company of Pittsburgh, an identified interest of Crucible Steel Company of America, of Pittsburgh, will issue \$3,000,000 5 per cent. bonds, the proceeds of which will be devoted to the building of two modern blast furnaces at Blair Station, to supply metal for the basic open hearth steel plant to be built by the St. Clair Steel Company at that place. This issue of \$3,000,000 of bonds is in addition to the \$2,500,000 5 per cent. bonds issued some time ago for the building of the steel plant. We may state officially that there have been no negotiations between officials of the United States Steel Corporation and Crucible Steel Company of America with a view of the former concern taking over the latter. What may be done in the future in this respect is, of course, problematical, but up

to this time there have been no negotiations looking to the absorption of the Crucible Steel Company by the United States Steel Corporation.

A very large output is being made at the Laughlin Works of the American Tin Plate Company, at Martin's Ferry, Ohio. The size of this plant is being doubled, and the new mills will be ready in a short time.

An attempt to form a new concern to operate the Wheatland mill of the Continental Iron Company, at Wheatland, Pa., has been given up.

The Cambria Steel Company have made a start at the new open hearth plant at Franklin, near Johnstown, and have already turned out some steel. Two of the group of the open hearth furnaces have been completed and started.

The Dennison Works of the American Sheet Steel Company, at Dennison, Ohio, which have been idle for some time, will be started up before long.

The Saltsburg Works of the American Sheet Steel Company, at Saltsburg, Pa., formerly operated by the Saltsburg Rolling Mill Company, but which have been idle for some time, will likely be started at an early date. The enormous demand for sheets is causing the leading interest to get out every ton of material possible.

### Machinery.

George P. Nichols and Bro., Monadnock Building, Chicago, who were awarded the contract for all the electrical machinery for the Taylor street bascule bridge to be erected in Chicago, have laid almost a mile of cable across the Chicago River. The bridge is to be built by the Chicago Terminal Railway Company, Chicago.

The Vilter Mfg. Company, Milwaukee and Chicago, have sold a 600 horse-power cross compound Corliss engine to the J. Rosenbaum Grain Company, Chicago, and a 300 horse-power engine to the Cincinnati, Hamilton & Dayton Railroad Company, Cincinnati.

The Root & Van De Voort Engineering Company of Champaign, Ill., are removing to East Moline. They will occupy a building erected for a stamping works and will remodel it to accommodate their machinery. The company are builders of a gasoline engine which has now been made for several years and has met with considerable success.

The Moline Pump Company, Moline, Ill., have determined to add to their business the manufacture of gas engines. The particular engine which they will build is the invention of one of their employees named J. A. Brown. It is of a new type, but has been the subject of exhaustive experiments for several months, and will be made in 2, 4 and 6 horse-power sizes. A two-story building, 33 x 58 feet, will shortly be erected to be used for this purpose.

Among recently licensed Illinois corporations is the McKelvey Concrete Machinery Company, with a capital of \$2500, to manufacture engines and machines. The incorporators are Samuel P. McKelvey, G. S. Noble and H. C. Hunberger.

E. Charboneau of the Twin City Iron Works, Hurley, Wis., intends to erect a foundry and machine shop at Ashland, Wis.

A. L. Ide & Sons, Springfield, Ill., have bought an abandoned high school property adjacent to their present plant. This purchase gives them an additional lot measuring 160 feet square, upon which a new foundry building will be erected. The present foundry area will be converted into additional machine shop room. This company report that the demand for the Ideal engines has made it necessary to increase their plant very materially.

The Gardner Governor Company, Quincy, Ill., made the inspection, last week, of their new plant an enjoyable event to their friends. The main building, to be used as the machine shop, was brilliantly illuminated and tastefully decorated with palms and draped with the national colors. The attendance of invited guests was most generous. The employees were also given the opportunity to invite their friends, and started off their introduction to the new plant most pleasantly. Active operations of moving the machinery were commenced after the formal opening occurred.

The Litchfield Foundry & Machine Company, Litchfield, Ill., with the opening of the spring months are beginning to receive inquiries, especially from coal mining companies, for their make of hoisting engines. Recent buyers have been C. B. Havens Coal Company, Omaha, Neb.; Weir Coal Company, Pittsburgh, Pa.; Lumaghi Coal Company, Collinsville, Ill. They are also building a pair of haulage engines for the coal company of the Missouri Pacific Railway Company for use in the Indian Territory.

J. W. Wright & Co., St. Louis, Mo., dealers in machinery and machine shop equipments, have secured the building, 801 N. Second street, at corner of Morgan street, and are now having it put into shape for the better handling of their growing trade. This company represent, among other makers, the Atlas Engine Works, Cincinnati Milling Machine Company, G. A. Gray Company, Bickford Drill & Tool Company, and Bradford Machine Tool Company.

James W. Lathrop, Mystic, Conn., manufacturer of gas engines, has recently enlarged his plant, and is now contemplating building another addition. During the past year his business has doubled and much labor saving machinery has been installed.



Jenkins & Lingle, Bellefonte, Pa., engineers, founders and machinists, suffered a \$3600 loss by fire at their foundry on the 16th inst.

The Derby Machine & Tool Company, Derby, Conn., fine dies, models and automatic machinery, have recently equipped their shops with a large engine lathe and an automatic drill press. A new department for electrical work and another for experimental work have been added. The company report business to be better than at any time for the last two years.

The Chapman Valve Mfg. Company, Indian Orchard, Mass., manufacturers of valves and fire hydrants, are building a brick addition, 150 x 50 feet, for storage of castings, and a second story addition to the pattern storeroom.

The Merrill Iron Works, Merrill, Wis., are installing a new 27-foot shafting lathe at a cost of \$1200. Other machines of improved design have recently been installed and the company are considering the enlargement of their main shop by a substantial addition.

The Jackson Mills Emery Company, Eastern, Pa., have received 600 tons emery stone from Greece. They are manufacturers of Turkish and American emery and are looking forward for a large supply of corundum from Canada. A new store and supply house is now in course of construction and in the near future they expect to enlarge their capacity.

The Prentiss Tool & Supply Company, 115 Liberty street, New York City, have shipped to the Brooklyn Navy Yard a 31-inch swivel head turret mill, 39-inch mill with two heads, 45-inch mill with one regular head and one turret head, and 45-inch mill with one turret head, manufactured by the Rogers & Hemphill Machine Company, Alfred, N. Y.

The National Rotary Valve Gas Engine Company, who recently organized, have purchased a machine shop at Dayton, Ohio, which they are equipping for the manufacture of gas engines for automobiles and stationary work. Edward Borderwick is manager.

The Ferracute Machine Company of Bridgeton, N. J., have just shipped a carload of presses, dies and other sheet metal machinery for their exhibit at the Pan-American Exposition, Buffalo, and they will ship another carload in a few days. They will exhibit 12 of their presses, the heaviest being a large double crank press, with friction clutch, arranged to be driven by an individual motor, and it will weigh about seven tons. This press is used for all kinds of heavy sheet metal work, and is especially adapted for armature disk work. Another press will be their geared coining press, weighing about three tons. This will be equipped with dies for making souvenir horseshoes for the Bryden Horse Shoe Company. They will have eight more power presses of various sizes and kinds, adapted for cutting, punching, forming and various other work. The largest of these is their geared punching press P4, with double feed rolls. There will also be a dial feed attachment, and one of the presses will be shown as a double action drawing press, for deep work. Among those above mentioned is a C92 notching machine for armature disks, which will be shown in working condition. There are other foot presses, dies and a large display of samples, photographs, &c. Their total space is about 30 x 22 feet, fronting on three aisles. They expect to have this first carload of machinery set up and running on opening day. The whole outfit will be driven by electric motors. Their exhibit will be given adjoining the Bryden Horse Shoe Company, who will show an outfit of their products with some of the machinery necessary for producing their work in small models made in Ferracute presses.

The Ettinger Machine Company, Limited, Chester, Pa., are one of the largest concerns of their kind in Eastern Pennsylvania. They are designers and builders of the circular bit, expansion cutter heads, solid flange cutter heads, and reversible cutters; in fact, a number of wood working specialties. The Ettinger cutter heads are widely known, having been successfully built for a number of years. The company are a partnership concern and are composed of the following: Robert E. Ross, W. W. Moss, J. Frank Black and Joel B. Ettinger.

The Bass Foundry & Machine Company, Fort Wayne, Ind., have received contracts for the following: One 14 x 36 inch Corliss engine for John Williams, New York City; two 18 x 36 x 48 inch cross compound Corliss engines for the New England Engineering Company, one for Palmer, Mass., and the other for Norwich, Conn., for direct connected street railway work; one 20 x 38 x 48 inch cross compound direct connected engine, three boilers, for the Oneonta, Cooperstown & Richfield Springs Railway Company, Oneonta, N. Y.; one pair of twin 28 x 42 inch engines for direct connection to 1000-kw. three-phase generator for the Wheeling Iron & Steel Company, Wheeling, W. Va.; one 32 x 58 x 60 inch heavy duty cross compound condensing double geared rolling mill engine and four 250 horse-power water tube boilers, for sheet mill plant for the Parkersburg Iron & Steel Company, Parkersburg, W. Va.; one 20 x 42 inch girder Corliss engine for Fred. Blmel, Portland, Ind.; one 24 x 48 inch heavy duty single geared rolling mill engine for the Tyler Tube & Pipe Company, Washington, Pa., for sheet mill service; one 32 x 54 inch single geared rolling mill engine for sheet mill service for the Whitaker Iron Company, Wheeling, W. Va.; one 30 x 60 inch heavy duty direct connected Corliss engine, one

32 x 48 inch heavy duty direct connected Corliss engine, one 26 x 30 inch piston valve engine and 1350 horse-power boilers, for the Highland Iron & Steel Company, Terre Haute, Ind.; three 72-inch by 20-foot high pressure horizontal tubular boilers, complete with all appurtenances, for the Elkhart Electric Company, Elkhart, Ind.; 12 72-inch by 18-foot high pressure horizontal boilers, complete with all appurtenances, for the Henderson Cotton Mills, Henderson, Ky.; three 72-inch by 24-foot high pressure 6-inch flued boilers, complete with all appurtenances, for the Muncie Pulp Company, Muncie, Ind.; one stand pipe, 16 feet in diameter, 120 feet high, for the town of Two Rivers, Wis. In connection with these they have approximately 4000 horse-power of feed water heaters to construct, together with a large amount of special work such as rope wheels, fly wheels, gears, jack shafts, &c.

The Schwartz Foundry Company, New Orleans, La., have secured contracts from the following sugar manufacturers: W. J. Kahod, Allandale plantation, La., and J. L. Ory, Woodland plantation, La. For their export department they are now building a sugar mill for General Friable of Mexico. The works are now running full time.

The Stover Engine Works of Freeport, Ill., have completed arrangements with Stuntz & Harden of Harrisburg, Pa., to represent them as Eastern agents for the sale of their gasoline engines. The Stover Engine Works have been running night and day to keep pace with the increased demand for their product. Among recent orders were two carloads of one style of engine from the same house.

Harry Gunther, founder and machinist, at Owensboro, Ky., has started a foundry and machine shop at 320 West Commerce street, San Antonio, Texas.

The Lewis Foundry & Machine Company, Pittsburgh, have a contract for a 9-inch finishing mill and a 14-inch roughing mill for the new plant of the Cuyahoga Iron & Steel Company, at Cuyahoga Falls, Ohio, which will adjoin the works of the E. A. Henry Wire Company, an identified interest. The output of the new plant will be wire and rods.

The Exeter Machine Works of Pittston, Pa., have appointed J. D. McIlwain & Co., 208-210 Third avenue, Pittsburgh, as sales managers for the Pittsburgh district. They are prepared to furnish plans, specifications and estimates for power haulage, conveying, elevating machinery complete, car wreckage outfits and hoisting engines for all kinds of work.

Niles Boiler Company, Niles, Ohio, have received a contract from the Youngstown Iron & Steel Roofing Company for the boilers for the new sheet mill to be built by the latter concern at Haselton, Ohio.

The Webster Mfg. Company, Western avenue and Fifteenth street, Chicago, have secured contracts for the elevating, conveying and power transmitting machinery for the Consolidated Cement Company, Milwaukee, Wis., and for all the power transmitting machinery for a large mining company in Monterey, Mexico.

The second pair of large blowing engines for the Illinois Steel Company have just been completed at the plant of the Mesta Machine Company, at West Homestead, Pa. The first pair have already been set up, and the second pair will be shipped within a few days.

Lemley & Schultz, engineers, machinists and millwrights, will move from their present quarters at 31 and 33 Indiana street, Chicago, about May 1. Although they have been in business a comparatively short time, their trade has attained such proportions that they have found it necessary to erect a special plant for their own purposes. The location is at Elston and Wabansia avenues. The main building will be 50 x 80 feet, two stories high, and will be used as a machine shop. A blacksmith shop, 30 x 30 feet, will adjoin this. The firm will make a specialty of the Lemley & Schultz disk friction clutches.

The National Transit Company, Oil City, Pa., are completing an addition to their present shop, an iron and brick building, 380 x 140 feet, in order to increase their facilities for constructing large pumps and gas engines for pipe line work. Four electrical cranes will be operated by dynamo, and everything in the machinery line will be up to date. The power to operate the plant will be produced by a gas engine constructed in their own shop.

#### Foundries.

Citizens of Oshkosh, Wis., are organizing a company for the manufacture of malleable iron castings. J. J. Stevenson, Elmer Leach and C. W. Davis are among those interested. Local manufacturers of wagons, carriages, pumps, logging tools and other products involving the use of malleable castings will be the principal stockholders.

The Dempster Mfg. Company, Des Moines, Iowa, will shortly increase their manufacturing capacity quite considerably. Several buildings are to be added to the plant, one of which will be used for a brass foundry. The business of the company has been growing rapidly of late.

The Keystone Car Wheel Company of Pittsburgh have let the contract for a large increase in their foundry. The capacity, when completed, will be about 600 wheels per day, or larger than any wheel foundry east of Chicago. Although the company were only incorporated in June and began operations

in September of last year, yet the success with which they have met and the demand created for their product has compelled the addition of machine shop and large addition to the foundry buildings, increased annealing room, &c.

The foundry and machine shop of McAddie & Co., at Cadillac, Mich., have been purchased by two brothers, Daniel S. and Frank Kysor. The former was for several years superintendent for William E. Hill & Co., Kalamazoo.

The Reading Foundry Company, Limited, Reading, Pa., will shortly reorganize. A charter has been applied for, which is expected to be granted May 6, when in all probability the foundry will be started up.

The J. A. Oberhelman Foundry Company, who recently incorporated, have succeeded to the jobbing foundry business of C. F. Thanwald & Co., Cincinnati, Ohio.

The United States Cast Iron Pipe & Foundry Company, at Buffalo, have been awarded the contract for furnishing 966 tons of cast iron pipe and 70,000 pounds of special castings, for the extension of the water distributing system of Syracuse, N. Y.

The large foundry of The Manufacturing Company, builders of railroad frogs, switches, crossings, &c., at Carlisle, Pa., which has been idle for four or five years, is being fitted up and work will begin by May 1. John Hays is president and general manager, and F. A. Shaffner superintendent and foreman of shops.

The Solid Steel Casting Company, Chester, Pa., are at present experiencing some difficulty with a number of their core makers. They have demanded additional pay for all time made over 60 hours per week.

The Ohio Pump & Brass Company have purchased the plant of the Patton Mfg. Company. They will manufacture a full line of steam, water and gas fittings, and make a specialty of hydraulic water lifts. They have a large foundry for brass, bronze and aluminum castings.

The Helmick Foundry & Machine Company are erecting a new plant at Park and Eighth streets, Fairmont, W. Va. The main building will be 50 x 120 feet, with suitable adjoining buildings for the power plant, cupola, &c. All the latest appliances will be installed for the manufacture of self-oiling car wheels, mining tippie chutes, castings and for structural iron work. Captain N. D. Helmick will be general manager and E. E. Helmick will have charge of the works.

The Youngstown Engineering Company are letting contracts for their new plant to be built at Youngstown, Ohio. It will include an open hearth steel casting plant. The contract for a good deal of the machinery has been given to the U. Baird Machinery Company of Pittsburgh, and also to the American Tool Company, at Cincinnati, and it is expected to have the plant running in about 60 days.

The Butler Street Foundry & Iron Company, 3424 to 3428 Butler street, Chicago, are erecting a three-story addition, 25 x 100 feet, to their plant. The first floor will be utilized as an office, the second as a pattern room and the third floor as a store room. The foundry is to be extended over the space now occupied by the offices. The company have just secured a contract for furnishing all the castings for a large building to be erected for Armour & Co., the extensive packers, Chicago.

#### Buildings and Bridges.

The American Bridge Company will furnish to J. G. White & Co., Incorporated, New York, the structural steel work for the power plant for the Kalgoolie Electric Power Company, Kalgoolie, Australia. This plant consists of an engine house 43 x 159 feet, with a lean-to 17 x 40 feet, and a boiler house 41 x 132 feet.

Wm. B. Scalfe & Sons, Pittsburgh, Pa., have received a contract from Spang, Chalfant & Co. for extensive additions to their Etna Tube Works. A number of large steel frame buildings covered with corrugated iron will be erected, involving a heavy tonnage of structural material.

The King Bridge Company of Cleveland, Ohio, have closed contract with the Lackawanna & Wyoming Valley Rapid Transit Company, for all of the bridges required on their road, aggregating approximately 6000 tons.

C. L. Strobel, contracting engineer, Monadnock Building, Chicago, has been awarded the contract for a bridge to be built over the canal at Delphos, Ohio, for the Pittsburgh, Fort Wayne & Chicago Railroad. It is to be a new type of lift bridge and will be the only one of its kind in the country.

The King Bridge Company of Cleveland, Ohio, have secured an order for five bridges which are to be erected in behalf of the United States Government at Santiago, Cuba.

#### Hardware.

The Stoutenburg Mfg. Company, Keltsburg, Ill., who make the Cannon Oilier, report an increasing demand for their specialty. The export trade particularly is promising. This oil can we are advised has been found by machinists, locomotive and stationary engineers, as well as the general trade, to bring about marked economy in the use of lubricants. The device consists especially of a force pump attachment, the mere pressure of the thumb on plunger discharging the oil to the bear-

ing to be oiled, without reference to the angle at which the spout may be inclined. No waste occurs, as the pressure on plunger determines the quantity to be discharged.

Cleveland Axle Mfg. Company, Canton, Ohio, have about decided to enter into the manufacture of carriage and wagon springs, and hope to have a plant for this purpose in operation shortly.

The Columbian Hardware Company, who have bought out the plant and business of the Van Wagoner & Williams Hardware Company, are securing figures for a contemplated addition to their power equipment.

The E. R. Wagner Company, North Milwaukee, Wis., have just been organized to manufacture parts for baby carriages, toy bicycles, &c. They will make a specialty of sheet steel stamping of all descriptions and solicit an opportunity to estimate on work of this kind. E. R. Wagner, manager of the company, was formerly with the C. J. Smith & Sons Company, Milwaukee, Wis., before they were absorbed by the American Bicycle Company.

#### Miscellaneous.

A. T. Stewart Company, Carnegie, Pa., makers of Universal plows and Apex pumps, have purchased all the rough and finished material, along with the patterns, patents and everything connected with the Princess Plow Company's business at Canton, Ohio, and have removed it to their factory at Carnegie, where it will be combined with their own line. There were some goods in the Princess line that A. T. Stewart Company needed in order to complete their own line. They expect to commence the manufacture of these goods in a short time.

The National Boiler Works, Chicago, are building a large flue for the Anaconda Mining Company of Anaconda, Mont. It is to be 176 feet long, 8 feet in diameter, and will contain 12 spouts. They are also building half a mile of 24-inch piping for the Chapin Mining Company, Iron Mountain, Mich.

Report has it that the Rolled Steel Car Company of Pittsburgh will build a plant at Haselton, near Youngstown, Ohio, for the building of what is known as the Carnahan rolled steel car. C. D. Carnahan of Pittsburgh is president of the new company and is also owner of the patents which cover the new design of cars. Col. J. M. Schoonmaker of the Pittsburgh & Lake Erie Railroad is said to be vice-president of the company.

More subcontracts for the Frick office building in Pittsburgh were given out in that city on Monday, by the Geo. A. Fuller Company, general contractors. The Rasmor & Dinger Company, cornice manufacturers at Second avenue and Ferry street, Pittsburgh, were given the contract for furnishing and putting up all the cornice and skylight work, while Joseph Woodwell & Co., hardware dealers, on Wood street, Pittsburgh, were given the contract for all the hardware for the entire building.

The Badger Brass Mfg. Company, Kenosha, Wis., manufacturers of Solar acetylene lamps, are building an addition to their works to increase their shipping and storage facilities and to add a small brass foundry.

The Monongahela River Consolidated Coal & Coke Company of Pittsburgh have given a contract to the Iowa Iron Company of Dubuque, Iowa, for a steel hull for a very large towboat. The hull will be 275 feet long, 64 feet wide, and will be the largest craft of the kind ever built for the Ohio and Mississippi river trade.

The Youngstown Specialty Mfg. Company, Youngstown, Ohio, makers of tin cans and sheet metal specialties, and recently taken over by the American Can Company, have officially gone out of existence. A meeting of the stockholders of the concern was held last week, and a sale of the plant to the American Can Company was ratified. The officials were advised to wind up the affairs of the company as soon as possible.

The Mitchell Coal & Coke Company have been organized at Williamson, W. Va.

It is stated that \$55,000 has been subscribed for a new car works to manufacture street cars, and to be located at Niles, Ohio.

The Kurtz Wagon Company of Marshalltown, Iowa, have been incorporated and will occupy the old Ketchum Wagon Company's works in that city, to which they will build an addition. The managers of the company are now purchasing machinery for the plant and a stock of material to enable them to begin to manufacture at an early day.

The property of the Elgin Tool & Socket Company, Elgin, Ill., has been sold to H. A. Smith, Jr., and Chas. Sherman, who will probably remove the plant to some other site.

The Whitney & Sloo Company, New Orleans, La., who are Southern agents for H. W. Johns Company, New York, state that business with them is very flourishing, especially in the roofing and pipe covering departments. They have secured some very large contracts in the rice country, having just completed one of the most extensive irrigation plants in the United States—the Lichenstein & Hessinger pumping plant. They are now about to start on the Abbot Dussan plants near Crowley, La., and expect to complete the work before the pumping season commences. Besides the plants named they have covered various others with the H. W. Johns covering.



## The Iron and Metal Trades.

The Steel Rail manufacturers have, at a meeting held on the 10th inst., taken a step which is interesting chiefly because it throws a flood of light upon the policy of the United States Steel Corporation. It is understood that at the initiative of this company it was decided to put up standard Steel Rails \$2 per ton, at mill, making them \$28 per ton, effective May 1. What considerations led to the step we have not been able to learn, but it is in direct conflict with what the Iron trade hoped would be the policy of the new corporation, that of "Better Service, Improved Quality and Lower Prices." As we understand it, the official reports of sales of Steel Rails from October 1 last to date, for 1901 delivery, foot up to 2,050,000 tons, exclusive of seconds, 5 per cent. of which may be delivered. In reality, therefore, the sales foot up to 2,150,000 tons. Nor are export sales included, which do not come within the province of the pool. These will probably amount to 300,000 tons. In other words, by far the greater part of the year's work is contracted for, and it would probably be a physical impossibility for the mills to turn out 350,000 tons more, in view of the heavy demands for Steel in other directions, which has turned off the Ohio plant from Rails. For a comparatively paltry sum, therefore, the Rail makers are exposing themselves to the charge of demanding all that the prices abroad will warrant. Unless some authoritative statement dispels it, the interpretation which the trade, which has little direct interest in this particular branch, will put on this advance on Rails will be that prices in other lines may be keyed up whenever conditions permit it.

Yet, in another direction, a more conservative course has been pursued. An association has been formed between the constituent companies interested in Steel Bars and the leading outside interests, the Republic Iron & Steel Company, the Cambria Steel Company and Jones & Laughlins, Limited. This association has fixed the minimum price on Bessemer Steel Bars at 1.40c., Pittsburgh, with half extras, for large contracts for future delivery. An advance of \$2 per ton is made in Open Hearth Soft Steel Bars, with certain extras on the higher carbons. The agreement covers also small Angles, Channels and other Shapes usually sold at rates governed by Bar prices, the base rate being 1.50c. Delivered prices are governed by the rates provided in the Tube rate book. It is understood that Western implement makers alone have contracted for about 100,000 tons. The new rates are lower than those recently ruling, in large lines, for early delivery. It is a very significant fact, too, that these sales cover the requirements of the season beginning next August and closing August, 1902.

The leading interests in the Central West have purchased further lots of Basic Pig Iron in the East, and have taken more Bessemer from local furnaces. It is understood, however, that no purchases of Bessemer beyond July delivery have been made. An interesting transaction is the sale of a round block of Dominion Basic Pig to a works in Eastern Pennsylvania, which is in position to apply the Iron to export shipments of Structural Material.

Generally speaking, the buying movement has shown some abatement, but that is not surprising, in view of the enormous booking for forward delivery which has gone on during the past two months.

## A Comparison of Prices.

At date, one week, one month and one year previous.

### Advances Over the Previous Month in Heavy Type. Declines in Italics.

	Apr. 24, 1901.	Apr. 17, 1901.	Mar. 27, 1901.	Apr. 26, 1900.
<b>PIG IRON:</b>				
Foundry Pig, No. 2, Standard, Philadelphia.....	\$15.50	\$15.50	\$15.40	\$15.75
Foundry Pig, No. 2, Southern, Cincinnati.....	14.50	14.50	14.50	14.20
Foundry Pig, No. 2, Local, Chicago.....	15.50	15.50	15.50	15.50
Bessemer Pig, Pittsburgh.....	16.75	16.75	16.75	15.00
Gray Forge, Pittsburgh.....	14.75	14.75	14.50	14.50
Lake Superior Charcoal, Chicago....	18.00	18.00	18.00	17.00

### BILLETS, RAILS, ETC.:

Steel Billets, Pittsburgh (nom.)....	24.00	24.00	24.00	25.50
Steel Billets, Philadelphia (nom.)..	27.00	27.00	26.00	28.00
Steel Billets, Chicago (nom.).....	26.00	.....	25.00	25.50
Wire Rods (delivered).....	38.00	38.00	36.00	32.00
Steel Rails, Heavy, Eastern Mill....	28.00	26.00	26.00	25.00
Spikes, Tidewater.....	1.60	1.60	1.55	1.70
Splice Bars, Tidewater.....	1.40	1.40	1.35	1.40

### OLD MATERIAL:

O. Steel Rails, Chicago, gross ton...	14.50	14.50	14.00	11.50
O. Steel Rails, Philadelphia.....	17.00	17.00	16.00	14.50
O. Iron Rails, Chicago, gross ton...	20.00	20.50	19.50	18.00
O. Iron Rails, Philadelphia.....	19.50	19.50	19.50	18.00
O. Car Wheels, Chicago, gross ton..	16.50	16.50	.....	15.00
O. Car Wheels, Philadelphia..	17.50	16.50	16.50	15.00
Heavy Steel Scrap, Chicago, gr. ton	14.00	14.00	13.50	10.00

### FINISHED IRON AND STEEL:

Refined Iron Bars, Philadelphia....	1.50	1.50	1.40	1.50
Common Iron Bars, Chicago.....	1.60	1.60	1.55	1.60
Common Iron Bars, Youngstown...	1.50	1.50	1.40	1.50
Steel Bars, Tidewater.....	1.60	1.62½	1.55	1.75
Steel Bars, Pittsburgh.....	1.40	1.50	1.45	1.65
Tank Plates, Tidewater.....	1.80	1.80	1.65	2.20
Tank Plates, Pittsburgh.....	1.60	1.60	1.50	2.10
Beams, Tidewater.....	1.75	1.75	1.75	1.65
Beams, Pittsburgh.....	1.60	1.60	1.60	1.50
Angles, Tidewater.....	1.75	1.75	1.75	1.70
Angles, Pittsburgh.....	1.60	1.60	1.60	1.50
Skelp, Grooved Iron, Pittsburgh....	1.80	1.85	1.70	1.65
Skelp, Sheared Iron, Pittsburgh....	1.75	1.85	1.75	1.90
Sheets, No. 27, Pittsburgh.....	3.25	3.25	3.25	2.50
Barb Wire, f.o.b. Pittsburgh.....	2.90	2.90	2.90	2.70
Wire Nails, f.o.b. Pittsburgh.....	2.30	2.30	2.30	2.10
Cut Nails, Mill.....	2.00	2.00	2.00	1.65

### METALS:

Copper, New York.....	17.00	17.00	17.00	19.25
Spelter, St. Louis.....	3.77½	3.80	3.72½	6.50
Lead, New York.....	4.37½	4.37½	4.37½	4.30
Lead, St. Louis.....	4.22½	4.22½	4.22½	4.17½
Tin, New York.....	26.00	26.25	26.15	25.50
Antimony, Hallett, New York.....	8.75	8.75	8.75	10.00
Nickel, New York.....	55.00	55.00	55.00	38.00
Tin Plate, Domestic Bessemer, 100 lbs., New York.....	4.19	4.19	4.19	4.05

### Chicago. (By Telegraph.)

Office of The Iron Age, 1306 Fisher Building, CHICAGO, April 24, 1901.

The placing of season contracts for Bars and other forms of Steel by agricultural implement manufacturers continues to be the leading feature of the market. The tonnage of the orders thus placed has been very heavy and is believed to be larger than at previous contracting periods. Other branches of the Iron trade show fair activity, with no indication of pressure to sell or weakening tendency in prices. General conditions are about as satisfactory as they could well be. The entire section tributary to this market is not only enjoying great present prosperity but prospects for the future are exceedingly flattering.

**Pig Iron.**—Some demand for Bessemer Iron is noted. The local Steel company have purchased a considerable quantity during the past week, and it is stated that more would have been bought if furnace companies selling in this territory had been able to supply it. Small consumers of Bessemer Iron are finding great difficulty in securing even a few carloads to satisfy their special requirements. Some contracts have been placed for Foundry Iron by implement manufacturers for delivery during the 12 months beginning with July. A heavy tonnage of Malleable Pig Iron has been placed in the past two weeks and buyers in this branch of trade are still in the market, some of them being urgent in their in-

quiries for Iron for prompt shipment. The general foundry trade is for the time being inclined to quietness. Small sales are being made, but inquiries are coming from consumers who are considering the purchase of their Iron for the last quarter of the year. The furnace companies, both North and South, are now in such condition that they are prepared to face a cessation of buying without anxiety, their product being well sold for several months. We quote as follows, Chicago delivery:

Lake Superior Charcoal.....	\$18.00 to \$18.50
Local Coke Foundry, No. 1.....	16.00 to 16.50
Local Coke Foundry, No. 2.....	15.50 to 16.00
Local Coke Foundry, No. 3.....	15.00 to 15.50
Local Scotch, No. 1.....	16.25 to 16.50
Ohio Strong Softeners, No. 1.....	16.50 to 16.75
Southern Silvery, according to Silicon.....	16.15 to 16.60
Southern Coke, No. 1.....	15.90 to 16.15
Southern Coke, No. 2.....	15.40 to 15.90
Southern Coke, No. 3.....	14.90 to 15.40
Southern Coke, No. 1 Soft.....	15.90 to 16.40
Southern Coke, No. 2 Soft.....	15.40 to 15.90
Foundry Forge.....	14.40 to 14.65
Gray Forge and Mottled.....	13.90 to 14.15
Southern Charcoal Softeners, according to Silicon.....	15.50 to 17.00
Tennessee Silicon Pig.....	16.50 to 17.50
Alabama and Georgia Car Wheel.....	20.65 to 21.00
Malleable Bessemer.....	16.50 to 17.00
Standard Bessemer.....	18.00 to 18.50
Jackson County and Kentucky Silvery, 8 per cent. Silicon.....	17.50 to 18.00

**Bars.**—A huge tonnage has been booked, consisting mainly of season contracts for implement manufacturers. The large implement makers are purchasing their complete requirements for a year from next July, but quite a number of the smaller manufacturers are purchasing only half of what they need, hoping that they may be able to do better later in the year. The contracts thus far made are somewhat larger than purchases made by the same parties in previous years. The general demand for Bars is large, and as has been the case for some time, is coming from all classes of consumers. The producing capacity for small sizes is so well covered for the next 60 days that idle mills are being started to meet a pressing demand for early shipment. The Republic Iron & Steel Company have this week started their Wetherald mill at Frankton, Ind., which has not been in operation for a considerable time. Mill shipments for reasonably early delivery are quoted at 1.60c. to 1.65c., Chicago, for Common Bar Iron; 1.65c. to 1.70c. for Soft Steel Bars, and 2c., base, for Hoops. The manufacturers of Soft Steel Bars are quoting 1.55c., Chicago, for shipment during the last half of the year. Jobbers find no cessation in the heavy demand from warehouse. They are still struggling with inability to secure full assortments. The demand is so much greater than receipts that sizes are continually running short. Small lots from stock are quoted at 1.90c. to 2c. for either Iron or Steel Bars, and 2.20c. to 2.25c., base, for Hoops.

**Structural Material.**—Chicago contractors are receiving bids on the material for a large Steel grain elevator to be built in New York harbor, which will require 6000 tons of Structural Shapes and about the same quantity of Plates. No large local work is at present in sight, except some city viaducts which may be a long time getting into shape. The large building projects this spring appear to have been covered by purchases of material made prior to the last advance. A fair demand is reported for small lots, owing to the great activity in the building trade, which is steadily consuming more material of this kind in buildings of small size. Mill shipments are quoted as follows: Beams, Channels and Zees, 15 inches and under, 1.75c.; 18 inches and over, 1.85c.; Angles, 1.75c. rates; Tees, 1.80c.; Universal Plates, 1.75c. to 1.85c.; small lots of Beams and Channels from local yards are quoted at 2.25c.; Angles, 2c. rates; Tees, 2.15c.

**Plates.**—The local mills are in steady receipt of orders which about equal their production. Specifications against contracts are coming in freely, and in some instances contracts are being taken out which were placed at boom prices, but on which specifications had been held back until now. Premiums are being paid by a few buyers to Eastern mills for prompt shipment. It is stated that deliveries can be made in four to six weeks by a number of mills, but certain consumers are unable to wait that long. Stove business is increasing. Mill

shipments are quoted as follows: Tank Plates, ¼-inch and heavier, 1.75c. to 1.80c., Chicago; Flange, 1.55c.; Marine, 1.95c. Jobbers are quite generally holding small lots from store at 2c. to 2.10c. for Tank and 2.25c. for Flange, with the usual extras for heads, segments, light gauges, &c. Good buyers have been able to shade these figures a little, but the market is steadily getting stronger.

**Sheets.**—Conditions are unchanged, the demand continuing heavy for mill shipments. Manufacturers are being obliged to refuse considerable business, being unable to make desired delivery. The crowded condition of the mills is throwing many carload orders into jobbers' hands for shipment from local stocks. Prices from stock are somewhat stronger on account of this addition to the ordinary store trade. Galvanized Sheets are quite generally quoted at 65 and 10 off, concessions from this price being made only to the very best buyers. Small lots of No. 27 Black are quoted all the way from 3.50c. to 3.65c., according to quantity.

**Merchant Pipe.**—Manufacturers and jobbers continue to enjoy a heavy trade. Mills are much in arrears on shipments. Manufacturers' prices, random lengths, are as follows:

	In carloads.	Less than carloads.
	Bk. Galvd.	Bk. Galvd.
¼ to ¾ inch and 11 to 12 inches.....	59.2 46.2	54.9 40.9
¾ to 10 inches.....	66.7 53.3	61.9 49.9

**Boiler Tubes.**—The demand is fair. Orders for Plates carry with them usually a quantity of Tubes. The manufacturers are now making more prompt shipments, but prices are firm. Quotations on less than carload lots from jobbers' stocks are as follows:

	Steel.	Iron
1 to 2½ inches.....	50	40
2½ to 5 inches.....	57½	47½
6 inches and larger.....	50 and 5	47½

**Rails and Track Supplies.**—Heavy Sections of Rails are in strong demand. The sales of the week aggregate about 40,000 tons, and inquiries for at least 75,000 tons have been turned down by local manufacturers because deliveries could not be made when desired. Some of the sales just made have been for delivery in November. Railroads which had placed large orders are taking good additional quantities for delivery late in the year. Much more business is in sight. Light Rails are also in good demand. Heavy Sections are quoted at \$26, and 30 to 40 lb. Rails are held at \$29 to \$32, according to quantity. Fastenings are in active demand, especially Spikes, for which very large inquiries are in the market, one calling for 25,000 kegs. Splice Bars are quoted at 1.55c. to 1.60c.; Spikes, 1.90c. to 2c.; Track Bolts, with Hexagon Nuts, 2.70c. to 2.80c., and with Square Nuts, 2.55c. to 2.65c. The usual advance is made on single carloads and on small lots from stock.

**Billets.**—While the local mills have no Billets for sale the nominal quotations on Bessemer Billets are \$26 to \$27, Chicago.

**Merchant Steel.**—Contracts with implement manufacturers are still the source of a great deal of business. The demand from this trade will probably continue for some little time, as the buyers are disposed to come in gradually. General manufacturing consumers are also buying in fair quantities. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery Steel, 2c. to 2.10c.; Smooth Finished Tire, 1.85c. to 2c.; Open Hearth Spring Steel, 2.30c. to 2.40c.; Toe Calk, 2.40c. to 2.60c.; Sleigh Shoe, 1.85c. to 1.90c.; Cutter Shoe, 2.40c. to 2.60c.; Cold Rolled Shafting, 55 off. Ordinary grades of Crucible Tool Steel are quoted at 6c. for carloads and 7c. from store; Specials, 13c. upward.

**Old Material.**—Stocks are evidently accumulating a little too rapidly, and large offerings are being made by dealers. Consumers are holding off, and under the impression that they can buy at lower prices. Some of the dealers are of the opinion that this is only a temporary condition, and that with the heavy consumption now in progress a better feeling will shortly be manifested. The following are approximate quotations per gross ton:

Old Iron Rails.....	\$20.00 to \$21.00
Old Steel Rails, mixed lengths.....	14.50 to 15.50
Old Steel Rails, long lengths.....	16.50 to 17.00
Heavy Relaying Rails.....	20.00 to 22.00
Old Car Wheels.....	16.50 to 17.00
Heavy Melting Steel Scrap.....	14.00 to 14.50
Mixed Steel.....	12.00 to 13.00



The following quotations are per net ton:

Iron Fish Plates.....	\$18.00 to \$18.25
Iron Car Axles.....	20.50 to 21.00
Steel Car Axles.....	16.00 to 16.50
No. 1 Railroad Wrought.....	16.00 to 17.00
No. 2 Railroad Wrought.....	14.00 to 15.00
Shafting.....	16.00 to 16.50
No. 1 Dealers' Forge.....	13.50 to 14.00
No. 1 Bushing and Wrought Pipe.....	12.00 to 12.50
Iron Axle Turnings.....	11.00 to 11.50
Soft Steel Axle Turnings.....	10.50 to 11.00
Machine Shop Turnings.....	9.00 to 9.50
Cast Borings.....	4.50 to 5.00
Mixed Borings, &c.....	4.50 to 5.00
No. 1 Boilers, cut.....	13.00 to 13.50
No. 2 Boilers, cut.....	10.00 to 10.50
Heavy Cast Scrap.....	12.00 to 12.50
Stove Plate and Light Cast Scrap.....	9.00 to 9.50
Railroad Malleable.....	12.00 to 12.50
Agricultural Malleable.....	11.00 to 11.50

**Metals.**—Carload lots of Lake Copper are steady at 17½¢, and Casting brands at 17¼¢. Pig Lead is unchanged at 4.32½¢ for Desilverized and 4.42½¢ for Corroding in 50-ton lots.

**Coke.**—The movement continues good and prices are maintained at \$4.85 to \$5 for Connellsville 72-hour Foundry Coke.

The Western trade of John A. Roebling's Sons Company and the New Jersey Wire Cloth Company, whose works are at Trenton, N. J., has grown to such an extent that it has been found necessary to enlarge their Chicago offices and warehouse. As a result they are remodeling their building at 171 and 173 Lake street, and will hereafter occupy all four stories instead of the first one, as heretofore. They are manufacturers of Wire Rope, Wire Lathing, Wire Cloth, &c., carrying heavy stocks in their Western house.

## Pittsburgh.

Office of *The Iron Age*, Hamilton Building, }  
Pittsburgh, April 24, 1901. }

(By Telegraph.)

**Pig Iron.**—The Pig Iron market is very strong, and a good deal of metal is being sold. A leading Steel interest is reported to have bought special round lots of Bessemer Iron for extended delivery, at prices equivalent to about \$16 at Valley furnace. Nothing has been done in Bessemer metal for second half, the United States Steel Corporation not having bought any Iron for that period. Forge Iron is strong at \$14 at furnace, while Foundry Iron is firm, but unchanged. We quote Standard Bessemer Iron at \$16 at Valley furnace for May and June, or \$16.75, Pittsburgh. Forge Iron is \$14.75 and No. 2 Foundry, \$15, Pittsburgh. Southern Forge is being sold at about \$14.50, delivered, Pittsburgh.

**Billets.**—There is nothing of interest to note in the Steel market. The minimum price of Bessemer Billets is \$24, Pittsburgh, while a little higher is quoted for prompt delivery. High grade Carbon Bessemer and Basic Billets carry the usual extras.

**Steel Rails.**—The Steel Rail mills have advanced prices of Steel Rails \$2 a ton, effective May 1, which makes the price \$28 for Standard Sections at mill. There is a large demand for Light Rails, and a scant supply, with a result that high prices are being obtained. Twenty-five pound Rails and lighter are selling at \$30 to \$32 at mill, while 30 to 45 lb. Rails are selling at \$28 to \$30. As a result of the organization of the United States Steel Corporation it is probable no more Rails will be rolled at the Ohio Works of the National Steel Company, at Youngstown. The contracts which this works have for Rails will be rolled at the Edgar Thomson Works of the Carnegie Steel Company, at Bessemer. The Ohio Works will run on Sheets, Tin Bars and Billets.

**Structural Material.**—The Cambria Steel Company have taken a contract for the material and buildings for a large addition to the plant of the Erie City Iron Works, at Erie, Pa.

(By Mail.)

Operations at many of the mills and manufacturing plants which line both sides of the Monongahela River, and also those located on the banks of the Ohio and Allegheny rivers, have been badly interfered with in the last few days by floods. The three rivers mentioned rose to an unusual height, and at some of the plants ma-

chinery was under water to the depth of 4 or 5 feet. However, the flood has receded rapidly, and by the end of this week the plants that were crippled by the high water will have been put in good shape and in operation. The damage done was largely from loss of time and injury to machinery. It has been stated that manufacturing plants in the Pittsburgh district suffered loss to the extent of \$1,000,000 by the high water, but this was probably overestimated. The resignation of Frank H. Buhl as president of the Sharon Steel Company is taken as an indication that that concern, if they have not already been absorbed by the United States Steel Corporation, soon will be. It will be recalled that about two weeks ago we stated in these columns that negotiations were on for the absorption of Sharon Steel Company by the Steel Corporation, but owing to opposition, principally from Mr. Buhl, the deal was not consummated at that time. It is understood that the other officials in the concern, aside from Mr. Buhl, are not so rigidly opposed to the consolidation as he was, and for this reason it will probably be put through. Nothing of special interest has developed in the Iron trade since our previous report. Demand in April has not been as large as for previous months, but it has been estimated that the mills on an average are 60 days behind in orders. This, together with new tonnage coming in right along, would seem to warrant the statement that present conditions and prices will be maintained until August or September. There is just as much trouble in getting prompt deliveries of material at the present time as ever, and there seems to be no doubt that were it not for the control of the market held by the United States Steel Corporation prices would be several dollars a ton higher than they are. The policy of this concern will be to put their Iron and Steel products on the market at as low price as possible. This accomplishes a twofold object. First, it discourages competition, and, second, increases consumption. With the enormous capacity of the plants owned by the United States Steel Corporation to turn out material, it will certainly be wise policy to do everything they can to increase consumption of Iron and Steel and find an outlet for material. We may note that plans are under way by this corporation by which their products will be carried by their own vessels to all foreign ports. In fact, plans are under way by this concern, which, when given out, will cause some amazement among those that even now are partly familiar with what they have in view for future development. Trade in Bessemer Iron is quiet and prompt metal is held at \$16 at furnace. Steel is quiet and very little is doing in the Pittsburgh district. Nearly all the local consumers are identified interests of the United States Steel Corporation and are supplied from their own works. In Finished Material prices are practically the same as last week. An item of interest in this connection is that the agricultural implement makers have come in the market in the past two weeks and have placed contracts for 50,000 to 75,000 tons of Steel Bars and other shapes.

**Ferromanganese.**—We continue to quote domestic 80 per cent. Ferro at \$58.50, delivered at buyer's mill. The reduction of \$4 a ton has pretty effectually shut out foreign.

**Muck Bar.**—We quote standard grades of Muck Bar at \$27 to \$27.25, delivered f.o.b. Pittsburgh. We may note that several thousand tons have been sold at the former price.

**Plates.**—The order for 5000 tons of Plates noted in the daily press as having been secured by Carnegie Steel Company from Harland & Wolff Ship Building Company, Belfast, Ireland, was taken some weeks ago. It is a fact, however, that other foreign contracts for Plates have been secured more recently. The general demand for Plates is good and the mills are more or less behind in deliveries. It is not probable Plates will be further advanced. Prices as fixed by the pool are rigidly held and we quote: Tank quality, ¼-inch and heavier, 1.50¢; 3-16 inch, 1.55¢; under 3-16 inch and above No. 10, 1.60¢; Flange or Boiler Steel, 0.1¢ advance over the base of Tank; Marine and Fire Box,

American Boiler Manufacturers' Association specifications, 0.2c. advance over Tank; Still Bottom Steel, 0.3c. advance over Tank; Locomotive Fire Box Steel and equivalent specifications, 0.5c. advance over Tank, all f.o.b. Pittsburgh.

**Bars.**—In the past week or two the Bar mills have entered some heavy contracts for Steel Bars and other shapes for the agricultural implement makers, the amount being estimated at 50,000 to 75,000 tons. While this is only a part of what will be required, yet it has had the effect of bringing practically all of the implement makers into the market, and inquiries given to the mills for several hundred thousand tons of Bars for delivery in second half of this year and first half of next year. These contracts are usually taken at very low prices, but as an indication of the strength of the Bar market we may state that the contracts so far entered have been very close to the carload price of Bars, which is 1.50c. at mill. Some of the mills do not seem disposed to take on very much of this class of business, believing that demand from the general trade will be large enough right along to insure plenty of business. We quote Steel Bars at 1.50c., at mill, but note that the contracts referred to above were taken at prices only slightly lower. In Iron Bars conditions are very satisfactory. The mills are well filled up and prices firm. We quote at 1.50c., Valley mill, carload lots. We quote Bands, 12-gauge and heavier, at 1.50c., base, with Steel card extras. Hoops are 1.90c. in carloads and 2c. in small lots.

**Merchant Steel.**—The market is very strong and a good deal of tonnage is being placed. Large consumers are coming into the market and placing orders for extended delivery. Prices are firm, but without change, and we quote: Plow Slabs,  $\frac{1}{4}$ -inch and heavier, 1.70c., base; Tire, 1.60c.; toe Calk, 1.75c.; Bessemer Machinery Steel, 1.50c.; Smooth Finished Steel, 1.75c.; Rolled Lay Steel, 2.75c.; Hammered Lay Steel, 3.50c.; Plow Slabs, 1.80c.; Cold Rolled and Cold Drawn Shafting, 55 per cent. off in carload lots, 50 per cent. in less than carload lots, delivered in base territory. Tool Steel, 7c. and upward, according to quality. On Tool Steel freight is allowed east of the Mississippi River.

**Sheets.**—There is no cessation in demand for Sheets, which continues larger than the mills have capacity for turning out. The settlement of the Sheet trouble at the Wood mills in McKeesport was very pleasing to the trade, as it was feared for a time that it would involve other Sheet mills and make the situation as regards delivery a good deal worse. We quote No. 27 Black Sheets, box annealed, at 3.25c.; No. 28, 3.35c., in carload lots. For large lots \$1 a ton less is quoted. We quote Galvanized Sheets at 70 and 5 per cent. off in carloads, maker's mill.

**Skelp.**—There is a heavy demand for Skelp and mills are loaded up with tonnage and away behind in deliveries. It is almost impossible to get prompt deliveries of Skelp at any price. We quote Grooved and Sheared Steel Skelp, ordinary widths, at 1.75c., while very narrow or very wide sizes are quoted at \$1 and \$2 a ton higher. Sheared Iron and Steel Skelp is held at 1.75c. to 1.85c. for ordinary sizes and up to 2c. for very narrow or very wide sizes.

**Tubular Goods.**—Demand this month has been good, but not quite as heavy as in March. The mills are all well filled up with tonnage and the tone of the market is strong. We note that a good deal of foreign business is being placed. The leading interest has taken quite a large tonnage for export shipment recently. Jobbers quote to small trade as follows:

Merchant Pipe.		Per cent.	Per cent.
		Black.	Galvd.
$\frac{3}{4}$ to $\frac{1}{2}$ inch and 11 to 12 inch.....		61	48
$\frac{3}{4}$ to 10 inch.....		68½	56
Casing, Random Lengths.		S. & S.	I. J.
2 to 3 inch.....		58	53½
3½ to 4 inch.....		63	59
4½ to 12½ inch.....		65	61½
Casing, Cut Lengths.		S. & S.	I. J.
2 to 3 inch.....		53½	59
3½ to 4 inch.....		59	55
4½ to 12½ inch.....		61½	57½

Boiler Tubes.		Up to 22 feet.
		Per cent.
Steel.		
1 inch to 1½ inch and 2½ inch to 5 inch, inclusive....		65½
2 inch to 2½ inch, inclusive.....		60
6 inch and larger.....		59
Iron.		
1 inch to 1½ inch and 2½ inch.....		43½
1½ to 2½ inch.....		43
2½ to 13 inch.....		53

Prices made by the mills to the jobbers are from 5 to 7½ per cent. less than the above.

**Coke.**—Last week out of 21,447 ovens in the Connells-ville region 19,968 were active and 1479 idle, the output having been 233,948 tons. There is a continued heavy demand for Coke and prices are firm. Strictly Connells-ville Furnace Coke is held by the leading interest at \$2 a ton and 72 hour Foundry at \$2.50 a ton to consumers. Main Line Furnace Coke is quoted at \$1.65 to \$1.75 and Foundry at \$2 to \$2.25 a ton, at oven. We may note that Main Line Furnace Coke for April shipment has been offered at less than our lowest price quoted above.

J. R. Patton & Co. have opened offices in the Ferguson Building, Pittsburgh, and are prepared to make immediate deliveries of second-hand Steam Shovels, Locomotives, both standard and narrow gauge, new and second-hand Rails and Mine Cars.

## Philadelphia.

Office of The Iron Age, Forrest Building, {  
PHILADELPHIA, PA., April 23, 1901. }

Developments during the past week have not been of an important character. There is a good business doing in all lines, and there are more complaints in regard to the difficulty of securing deliveries than there is of any scarcity of orders. This, however, has been the condition for some weeks past, but the stringency is probably somewhat less than it was at that time. The feeling gains ground that prices have about reached their maximum for the present, consequently buyers are less disposed to place new orders unless to cover special requirements. There is too much business on the books, however, to permit of any marked weakness in prices, but it is quite likely that we shall have a period of dullness before there is any very distinct renewal of active buying. The amount of business placed during the first quarter of the year was almost beyond precedent; consequently there is really no necessity at the present time for renewal orders; yet, as we said before, the movements from mills and furnaces are on an enormous scale, and it is this, after all, which will prevent any material change in prices. There are indications of a desire on the part of sellers (in some lines) to secure a full line of business for delivery during the last half of the year, and the contest in regard to prices will probably be on such orders rather than on those for the first half, which, as a matter of fact, is already fully secured. The general outlook therefore, may be summarized by saying that there are no evidences of a decreased volume of business, but, on the contrary, the general impression is that the summer and fall of 1901 will surpass all former records. In regard to prices, however, there are differences of opinion, the general idea being that the present limits are high enough for a safe and permanent run of business.

**Pig Iron.**—There is nothing unusual in the market except a slight scarcity of Pigs for mill purposes and for Steel making, which are firmly held at last week's quoted rates. Foundry Irons, however, are in moderately full supply, so that buyers have not been under the necessity of advancing their bids. The inside price for No. 2 X is \$15.50. In some cases \$15.75 is paid for an extra good Iron, but the former figure fairly represents the market in this vicinity. Buyers are tolerably covered to July, and in many cases at less than to-day's prices, and as prospects indicate a larger production in the near future, they are inclined to postpone placing new orders at advanced rates until they can get more light on the situation. Sellers are more disposed to push business for delivery during the last half of the year, and when the right kind of bid comes along there is a very fair chance of its being accepted. There is nothing which can be



defined as real weakness anywhere, but there is a feeling of easiness which is more in evidence now than it has been for some weeks past. Stocks on furnace banks are very light, however, and sellers in the meantime appear to hold a fairly safe position due to the continuously large consumption, present as well as prospective. General quotations for seaboard or nearby points, however, would be about as follows: No. 1 X Foundry, \$16 to \$16.25; No. 2 X Foundry, \$15.50 to \$15.75; No. 2 Plain, \$15 to \$15.25; Standard Gray Forge, \$14.50 to \$14.75; Ordinary Gray Forge, \$14 to \$14.25; Basic (Chilled), \$14.50 to \$14.75, furnace, and Standard Bessemer, \$15 to \$15.25 at furnace.

**Billets.**—Except for special qualities, which range from \$28 to \$30, there is not much demand. Ordinary Soft Steel is in limited supply, but in all probability could be had from \$26.50 to \$27, according to quality and date of delivery.

**Plates.**—New business is not quite as much in evidence as it was a few weeks ago, except from the smaller and medium class of consumers. Bridge works and shipyards appear to have covered their requirements temporarily, but there is a great amount of figuring for new work going on; but until the contracts are closed it is impossible to say what the exact tonnage will be. Prospects at all the shipyards are extremely good, however, and work to their full capacity is assured for months to some; but with the extensions and additions which have been made to the shipbuilding facilities, they will be enabled to handle more business by the time plans and specifications are ready. Prices are as last quoted, viz: Plates,  $\frac{1}{4}$  inch and thicker, 1.80c. to 1.85c.; Universals, 1.80c. to 1.85c.; Flange, 1.90c. to 2.10c.

**Structural Material.**—The situation is very much the same as that in Plates, so that there is no need for special remark. There is a good deal of work in hand and a great deal more is expected to be placed at an early date, but in the meanwhile new orders are neither very large nor very abundant. Prices are firm and unchanged as last quoted for seaboard or nearby deliveries: Angles, 1.75c. to 1.85c.; Beams and Channels, 15-inch and upward, 1.75c. to 1.85c.

**Bars.**—There is an excellent demand for Bars which is specially felt by the mills which are adjacent to the Western territory. A great many orders for Skelp have recently been placed, and it is no easy matter to meet all the requirements as regards time for delivery. Nearer to the seaboard, however, there is not quite as much urgency, although there is plenty of work at quoted rates, and all the mills seem to be running to their full capacity. Prices are strong and usually quoted 1.50c. at mills, equivalent to 1.55c. to 1.60c. seaboard or other nearby points. Steel Bars, 1.62 $\frac{1}{2}$ c. to 1.70c.

**Sheets.**—There is no abatement in the demand for Sheets, but finding it impossible to place orders for delivery during the first half of the year, buyers are now inquiring for quotations for deliveries to run through the last half. Prices, of course, are very irregular, but, as a rule, may be quoted as follows for Best Sheets (common Sheets two-tenths less): No. 10, 2.50c.; No. 14, 2.70c.; No. 16, 2.90c.; Nos. 18-20, 3.40c.; Nos. 21-24, 3.50c.; Nos. 26, 27, 3.65c.; No. 28, 3.75c. to 3.80c.

**Old Material.**—There is a somewhat mixed condition of affairs in Old Material, some asking very extreme prices, others accepting about last week's figures. There are some evidences of larger offerings, and consumers appear to have resolved not to pay the extreme figures which some are now asking. Sales of choice Steel Scrap have been made at \$17.50; a lot of choice Bridge Scrap at 1c. a lb., and Car Wheels at \$18.50. Bids and offers are about as follows for deliveries in buyers' yards: Choice Railroad Scrap, \$19.50 to \$20.50; Country Scrap, \$16 to \$17; No. 2 Light Scrap, \$12 to \$13; Machinery Cast, \$14 to \$14.50; Heavy Steel Scrap, \$16.75 to \$17; Old Iron Rails, \$19.50 to \$20.50; Old Steel Rails, \$17 to \$17.50; Wrought Turnings, \$12 to \$12.50; Cast Borings, \$8.75 to \$9; Old Car Wheels, \$17.50 to \$18; Iron Axles, \$22 to \$23; Steel Axles, \$17 to \$18.

The plant of the Tidewater Steel Works, Chester, Pa., is being offered for sale. To avoid misunderstand-

ing as to which Steel company this represents, we are desired to say that the Tidewater Steel Works of Chester, Pa., have no connection with the Tidewater Steel Company of Chester, Pa. The Tidewater Steel Works are the successors to the Combination Iron & Steel Company.

Justice Cox, Jr., & Co., Limited, 552-554 Bullitt Building, Philadelphia, have added a Coal and Coke department to their business, being the agents of the Big Run Coal Mining Company.

## St. Louis. (By Telegraph.)

Office of The Iron Age, 1205 Chemical Building, St. Louis, April 24, 1901.

**Pig Iron.**—The principal efforts of all concerned in the Pig Iron trade from producer to user is to ship and receive stock more promptly. Consumption is holding up with great strength, and that activity in the foundry interests is bound to keep up for months longer is seen by the close watch which is being kept on stock piles. Special brands for mixtures are in constant demand. Buying for the week is of unchanged character. There is a steady movement of Pig Iron in a small way, but no new business of importance has been developed. Prices of Southern Iron are being firmly held, producers having their output for the next few months so well covered that they, to some extent, feel independent of the market. Foundry Coke is in active demand, Connellsville being quoted at \$5.15, East St. Louis. We quote, f.o.b., St. Louis:

Southern, No. 1 Foundry.....	\$15.50 to \$15.75
Southern, No. 2 Foundry.....	15.00 to 15.25
Southern, No. 3 Foundry.....	14.50 to 14.75
Southern, No. 4 Foundry.....	14.00 to 14.25
No. 1 Soft.....	15.50 to 15.75
No. 2 Soft.....	15.00 to 15.25
Gray Forge.....	13.75 to 14.00

**Bars.**—The constant demand for Bars reflects the active operations of manufacturing establishments. Vehicle manufacturers report a heavy business and at a much earlier period than usual. Car builders are busy in all departments. Agricultural implement makers are preparing for a prosperous trade and are placing substantial orders for mill product. Jobbers are having complaint as to delayed shipment and meanwhile are sending assortments out of stock for urgent wants. Prices are quotably higher both by mills and jobbers. Mills quote Iron and Steel 1.65c. to 1.75c., half extras, East St. Louis. Jobbers quote Iron 1.90c. to 2c.; Steel, 2c. to 2.10c., full extras.

**Rails and Track Supplies.**—New business in Track Supplies is not quite so heavy, the principal needs for the summer's work having been covered. Correspondence now deals mainly with material coming forward on old contracts. In many cases roads are experiencing delay on account of crowded condition of mills. The general miscellaneous wants of railroads are exceedingly heavy. Dealers report that sales for each month have been better than for corresponding months of 1900. We quote: Splice Bars, 1.70c. to 1.80c.; Bolts, with Square Nuts, 2.50c. to 2.60c.; with Hexagon Nuts, 2.65c. to 2.75c.; Spikes, 1.90c. to 2c.

**Pig Lead.**—The market in Pig Lead is rather quiet, but the undercurrent of buying is strong. May Lead is fairly well sold up and some producers find themselves behind on April specifications. All Missouri brands are selling at 4.22 $\frac{1}{2}$ c. Desilverized is unchanged at 4.32 $\frac{1}{2}$ c. Lead Ore fell off to \$45 per ton.

**Spelter.**—Not much activity in Spelter at present. Prices are quotably lower, ranging from 3.77 $\frac{1}{2}$ c. to 3.80c. There has been considerable interest shown in Zinc Ore, the low and medium grades making fair gains in value. Top grades sold at \$29.50 per ton.

Hickman, Williams & Co., Pig Iron commission merchants, will open a branch office in St. Louis May 1, with Ben. P. Williams as local manager.

The Bessemer & Lake Erie Railroad, recently acquired by the United States Steel Corporation, are buying more land at Greenville, Pa., and will greatly extend the railroad shops at that place.

**Cincinnati.** (By Telegraph.)Office of *The Iron Age*, Fifth and Main streets, }  
CINCINNATI, April 24, 1901.

As was pretty generally anticipated, the Pig Iron market for the past week has been very quiet. If it was not for the recent satisfactory activity selling agents would call it positively dull. There has been a pretty general buying of Car Wheel grades and some very good sized orders are reported to the agencies with headquarters in this city. Outside of this buying has been confined to a retail trade, with but comparatively few orders for over 100-ton lots. There is no feature worthy of special comment and a quiet time is expected for the next few weeks. There is no apparent reason for expecting any weakness to develop and prices are practically unchanged, and on this basis the market may be called steady. Freight rate from Birmingham is \$2.75 to this point; from Hanging Rock district, \$1. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1.....	\$15.00 to \$15.25
Southern Coke, No. 2.....	14.50 to 14.75
Southern Coke, No. 3.....	14.00 to 14.25
Southern Coke, No. 4.....	13.25 to 13.50
Southern Coke, No. 1 Soft.....	15.00 to 15.25
Southern Coke, No. 2 Soft.....	14.50 to 14.75
Southern Coke, Gray Forge.....	13.25 to 13.50
Southern Coke, Mottled.....	13.25 to 13.50
Ohio Silvery, No. 1.....	16.00 to 16.50
Ohio Silvery, No. 2.....	15.00 to 15.50
Lake Superior Coke, No. 1.....	15.75 to 16.00
Lake Superior Coke, No. 2.....	14.75 to 15.00
Lake Superior Coke, No. 3.....	13.75 to 14.00
Southern Basic.....	14.50 to 14.75

**Car Wheel and Malleable Irons.**

Standard Southern Car Wheel, chilling grades.....	\$18.25 to \$18.75
Standard Southern Car Wheel, No. 2.....	17.25 to 17.75
Lake Superior Car Wheel and Malleable.....	18.50 to 19.00

**Plates and Bars.**—The market is very strong and active, with Structural Material leading the list. Angles are very strong. We quote, f.o.b. Cincinnati: Iron Bars, in carload lots, 1.60c., with half extras; same in small lots, 1.80c., with full extras; Steel Bars, in carload lots, 1.15c., with half extras; Base Angles, in carload lots, 1.80c.; Plates, ¼-inch and heavier, 1.80c.; Sheets, No. 16, 2.50c.

**Old Material.**—The market has been strong and active, with unchanged quotations. Dealers' buying prices per gross ton are, f.o.b. Cincinnati: No. 1 Wrought, Railroad Scrap, \$15.50; Cast Railroad and Machine Scrap, \$11; Old Iron Axles, \$16.75; Iron Rails, \$18; Steel Rails, rolling mill lengths, \$13; short lengths, \$12; Car Wheels, \$15.

**Birmingham.**

BIRMINGHAM, ALA., April 22, 1901.

A quietude pervaded the Iron market the past week and it is no easy matter to quote exact prices. While some reports of sales of No. 2 Foundry at \$12 are received, there are other interests which report sales at \$11.75, and yet another interest say they offered No. 2 Foundry at \$11.50 and failed to receive the order. The difference between the figures reported by various interests is accounted for by the fact that small orders and nearby deliveries still command a premium. It is yet a noticeable fact that the acceptance of an order is followed in a day or so by urgent request for prompt shipment. The sales agents at the buying centers are unanimous in statement that the requirements in the near future are sufficient to insure good business. When you consider in addition to this encouraging feature the further fact that the probability is that we will in the near future have some four or five stacks shut down for repairs one can readily understand why the situation here is considered as comfortable.

Special attention is being given to the economy of assembling the raw material and the latest improved and approved means for doing this will be installed. Cheapness of production is the knotty problem that faces our Iron men at this time. The Ore fields heretofore worked supplied the Ore "cheap as dirt." But as you get down into the bowels of Mother Earth, the Ore gets lean and limy, making it hard and more difficult to mine, and consequently increasing the cost. In some cases it has taken 3 tons of Ore to produce 1 ton of Pig Iron. It is not intended to convey the idea that this is the rule.

Nor is it intended to create the belief that our Ore is playing out. The idea is that enough of the mines are producing sufficient lean Ore to make the cost of mining now an item of special consideration.

The annual report of the president of the Sloss Company shows that their output for the year was 210,268 tons of Pig Iron, 1,052,524 tons of Coal, 367,989 tons of Coke. Of Brown Ore they mined 129,502 tons, and of Red Ore 243,125. Total Ore mined, 372,627 tons. So in this case it required about 1.8 tons of Ore to make 1 ton of Pig Iron. The property list shows six 200-ton furnaces, 63,603 acres of Coal lands, 48,005 acres of Ore lands, and 1100 Coke ovens.

Some changes have been made among the officials of the Tennessee Company and the places vacated filled in several instances by selections already made. These changes indicate new methods in management. There are plenty of rumors afloat, the most important of them being that the latest improvements to add to efficiency will be inaugurated. The Steel Rail mill is fast coming to the front. During the past week their first order for Steel Rails was registered and as the main engine is now arriving from Milwaukee the work of pushing to completion will be continued with ardor.

**The German Iron Market.**

ESSEN, March 29, 1901.—It has rarely been so difficult a matter to report on the German Iron market as it is now, since there can hardly be a question of current business.

For weeks negotiations have been proceeding over the lowering of prices on old contracts for raw material and intermediate products. The Steel Syndicate, as was noted in my last report, has made allowances in prices on old contracts, but thus far this body has been the only one, and it looks as though the refusals on the part of the Pig Iron, the Iron Ore and the Coke Syndicate to follow this example may be regarded as final. Recent negotiations in this direction have left very little hope. The opinion is expressed in many quarters that any lowering in prices thus conceded does not redound to the benefit of the manufacturer of the finished material because the consumer simply demands at a price corresponding to this lowering.

In all directions efforts are being resumed to form syndicates. In Upper Silesia negotiations are under way to unite the blast furnaces in a Pig Iron syndicate similar to that of Western Germany. Work has been resumed also on the formation of a general German Sheet syndicate, which months ago were nearly concluded, and then at the last moment collapsed owing to the excessive demands of the Silesian mills. It is expected that a favorable issue will result. It is probable also that the negotiations for the renewal of the Plate syndicate will be successful. In Cast Iron Pipe a syndicate has been completed during the past few days, but on the other hand the prospects for the renewal of the Wrought Iron Pipe Syndicate, which expires on June 31, is not particularly favorable. It is very difficult to see how an extension can be arranged for, as conditions have undergone a very serious change through increase in competition within and without the syndicate. Some of the works have been very considerably enlarged. Finally the statement may be made that another effort is under way to bring about a Bar syndicate, but it looks doubtful whether it will be possible to bring under one control the large number of works, some of which are small in capacity.

New business has not developed in Ores. Foreign, notably Spanish and Mediterranean Ores, are offered at 18 marks f.o.b. Ruhr ports as the result of low freights. Deliveries of Spathic Iron have declined, and although the full production of the syndicate mines has been sold to the end of 1901 some of them are even now forced to restrict output because the furnaces are not in a position to take the quantities contracted for. Fresh sales of Spathic Ore are naturally out of the question, and the unchanged prices made by the syndicate are therefore purely nominal.

The condition of affairs in Pig Iron is similar, since only small blocks of Foundry Iron are being closed.



English No. 3 is quoted 68 marks f.o.b. Ruhrort, while Luxemburg is 58 marks at furnace. Prices for German Pig Iron are unchanged, but absolutely nominal owing to lack of business. Some stray inquiries have been received from America for Spiegeleisen, but it is only a question of a few thousand tons. More Old Material is being offered than the works are capable of absorbing in view of the restricted output. However, Cast Scrap is quoted 57 to 58 marks, Melting Scrap, 35 to 36 marks; Heavy Open Hearth Scrap, 52 to 53 marks; Old Iron Rails, 67 to 68 marks and Wrought Scrap 53 marks.

Business is light in Steel. The demand is very small, and therefore the Steel works have been forced to reduce output in many cases. Prices are 97 marks for Ingots, 102 marks for Blooms, 107 marks for Billets and 110 to 112 marks for Slabs. If there is not, contrary to all expectations, greater activity in Finished Steel, there is no chance of a change in the Billet trade for some time to come. High Carbon Bessemer Steel is very quiet, prices remaining at about 140 to 145 marks per ton, according to carbon content. No business is being done in Muck Bar. The stock at some points is pretty heavy. Many works which formerly bought Muck Bar are puddling into stock in order to meet their contracts for purchased Pig Iron. Good Westphalian and Siegen Bars are selling at 105 to 110 marks.

There has been very little change in recent weeks in Finished Iron and Steel. Prices have declined further, and particularly in Bars and in Sheets have reached a point which recalls the worst times and which leads to heavy losses on the part of the mills. What work is coming in is for prompt delivery, an indication that requirements are being held back to the utmost. The business in Iron finished goods suffers more particularly through the low prices made in Finished Steel, and there really seems a danger that that branch of industry will be crushed out altogether. Steel Bars are being sold under 110 marks per ton, while Iron Bars are offered at 125 marks. It will be recognized under what conditions the works are now operating when it is taken into consideration that Billets cost 107 marks and that Muck Bar at present Pig Iron prices can hardly be made under 130 marks. It is true that this disparity is somewhat modified by the low prices at which Old Material is being offered. Besides the works have contracts on their books at better prices, but the consumption of Old Material is light because most of the works are heavily overloaded with Pig Iron.

Business in Hoops is prostrated. The official price for Hoops was lowered from 140 marks to 125 marks at a recent meeting of the associated works. This price, however, is purely nominal, because Hoops are actually being offered by some at 110 marks.

The Skelp business, too, is suffering from lack of work, since the Pipe mills have heavy stocks, therefore the improvement in this line has not yet reacted upon the raw material. Prices have been lowered in accordance with the general situation. Steel Boiler Tube Skelp is quoted 135 to 140 marks, according to gauge, Iron Gas Pipe Skelp at 150 marks, and Iron Boiler Tube Skelp 165 to 175 marks. So far as the Pipe mills themselves are concerned the sales have become somewhat larger recently, but prices remain considerably below cost. The Pipe mill at Raunheim on the Main closes down at the end of this month entirely, and will discharge all the officers, foreman and workmen. The directors remark that at present prices of manufactured goods there is no chance of producing at a profit even when basing costs on the lowest current prices for raw materials. They state that they would be prepared to meet further losses if there were any chance of any improvement, and if there were not an artificial pressure upon prices whose end cannot be anticipated.

In the Plate trade there has been a livelier inquiry owing to receipts of more specifications, particularly for Ship Plates. These came at the right time, because complaints were beginning to be made of lack of work. The reduction in prices on Merchant and Structural Plates has been without notable influence upon sales. Whether a further reduction in prices is to be made is to be decided in the near future. Ordinary Steel Plates are sold

at 140 marks per ton. Structural Plates at 145 marks; with test, 10 marks more, f.o.b. Essen, Dillingen, Siegen and Koenigshuette. To-morrow a final decision is to be reached at a meeting to be held at Essen on the renewal of the Plate Syndicate. It is the intention also to discuss the question whether and to what extent reductions are to be made on old contracts.

The Sheet market is in pretty bad shape, although here, too, a slight increase in inquiry and in work has been noted. Under conditions Common Sheets are selling at 125 to 130 marks.

The demand is still very light in Beams. What orders are coming in are turned over by the syndicate to dealers who are under obligations not to sell under 110 marks f.o.b. mill, because otherwise the reduction in price accorded to them will be withdrawn.

The improvement in American conditions has at last had its effect upon the Wire market, the pressure from your country having ceased in all the different branches. As a result of and in consequence of expected changes in the tariff there has been more activity in the South American and Australian markets, Barb Wire selling for some time at such a rate that the works find it difficult to keep up, and there is a good business, too, in ordinary Fencing Wire. As a result of the heavy pressure on prices work is diverted chiefly to those mills who roll their own Rods. So far as Wire Nails are concerned the home demand which had become more active in January fell off again early in February, because the consumers expected as a result of a lowering in Wire Rod prices for South Germany that values for the second quarter might recede further. In the second half of February, however, business became more active. So far as the foreign markets are concerned the sales of the syndicate were very good as to quantity. In January and February the Berlin sales office sold 8968 tons, the Mannheim sales office for Southern Germany sold 1704 tons, and the export bureau at Hamm marketed 10,719 tons, a total of 21,391 tons. To this must be added 5322 tons of contracts for delivery. There was shipped from Berlin 6679 tons, from Mannheim 1618 tons, and from Hamm 6378 tons, so that orders to the extent of 11,678 tons remained. For account of the syndicate there were sold for inland delivery 7960 tons of Wire Nails, and for export 7075 tons. The orders booked increased during January by about 9000 tons.

The demand for Cast Iron Pipe is pretty active, both for domestic and for foreign markets, and it is expected that with the opening of spring a further development of inquiries will come and with it an improvement in prices. The car works are well supplied with orders by the last specifications issued by the State roads. How employment will develop after that depends upon the general condition of other industries. If the freight situation so far as railroads are concerned should grow worse it will not be possible to count upon larger orders for new equipment from the State road. With the exception of the machine tool works the machinery plants are well supplied with orders, although activity is not anywhere near what it was a year ago. Business in American machine tools is quite prostrated.

Your readers may be interested in the report that the new American trust is negotiating with the Bochum Verein on co-operation in the Rail trade. The report originated in the Berlin Stock Exchange and led to some advance in the stock of the Bochum Verein.

## New York.

Office of *The Iron Age*, 232-238 William street, New York, April 24, 1901.

**Pig Iron.**—The local market continues rather quiet. Some of the leading consumers in this section are looking into the question of making purchases for the third quarter, but little has yet been done. The feeling is that after July consumption may possibly show some falling off. A number of the managers of the Eastern blast furnaces had a conference last week to study the question whether there is a chance by co-operation to bring about a better state of affairs, but nothing tangible was developed and efforts in this direction seem to have been

abandoned. Some of the Eastern furnaces have made further sales of Basic Pig to go to Pittsburgh. We quote: Lehigh, Schuylkill and Virginia Irons, No. 1, \$16.50 to \$17.50; No. 2 X, \$15.50 to \$16; No. 2 Plain, \$14.25 to \$14.50; Gray Forge, \$14 to \$14.50; Tennessee and Alabama brands, No. 1 Foundry, \$16 to \$16.25; No. 2 Foundry, \$15.25 to \$15.75; No. 1 Soft, \$16 to \$16.25; No. 2 Soft, \$15.25 to \$15.75; No. 3 Foundry, \$14.50 to \$14.75; No. 4 Foundry, \$14.25 to \$14.50; Gray Forge, \$14.25 to \$14.50.

**Cast Iron Pipe.**—The demand for small lots continues brisk. No large orders have been placed. The shops seem to be filling up and competition is not quite as keen as it has been. We quote \$23 to \$23.50 per gross ton, tidewater.

**Steel Rails.**—It has come out that over ten days since the Steel Rail manufacturers decided to advance prices for Standard Sections to \$28 at mill, the advance to go into effect on May 1. It appears that buyers generally were given the opportunity to book, so that a considerable tonnage pending has been closed. It is estimated that the domestic requirements this week will foot up 2,500,000 tons, making this the banner year in the history of the trade. Of this quantity about 2,200,000 tons is booked, counting seconds. Some of the mills are even now not in a position to make deliveries for many months to come. We quote \$28 for Standard Sections and \$32 to \$32.50 for Girder Rails. We quote Spikes, \$1.60c. to 1.65c.; Splice Bars, 1.40c. to 1.45c.; Square Track Bolts, 2.10c. to 2.15c., and Hexagon Bolts, 2.20c. to 2.25c., at mill.

**Finished Iron and Steel.**—The tonnage booked in the shape of smaller lots is very large. During the last week no very large orders for Structural Material have been taken, but there is a good deal in sight. We quote as follows at tidewater: Beams, Channels and Zees, 1.75c. to 1.80c.; Angles, 1.75c. to 1.80c.; Tees, 1.80c. to 1.85c.; Bulb Angles and Deck Beams, 2c.; Sheared Steel Plates are 1.85c. to 1.70c. for Tank, 1.75c. to 1.80c. for Flange, 1.88c. to 1.90c. for Fire Box. Charcoal Iron Plates are held at 2.25c. for C. H. No. 1, 2.75c. for Flange, and 3.25c. for Fire Box. Refined Bars are 1.50c. to 1.60c.; Common Bars, 1.40c. to 1.45c.; Soft Steel Bars, 1.60c. to 1.62½c., and Hoops, 1.90c. to 2c., base, on dock.

The American Sheet Steel Company of Battery Park Building have issued a revised and corrected table of the standard sizes and gauges of Galvanized Sheets, showing the weight of each sheet and the weight of each bundle. The table is printed on heavy cardboard in very clear letters and is arranged so that it can be readily hung up.

Carpenter Steel Company of 1 Broadway announce that Hermann Boker & Co. no longer represent them as sales agents of their tool steel. The John Illingworth Steel Company of 107 John street will hereafter sell their Tool Steel and other specialties in the Eastern and Middle States, and will carry in their warehouse a stock for the execution of orders requiring prompt delivery.

## Metal Market.

Office of The Iron Age, 232-234 William street, }  
New York, April 24, 1901. }

**Pig Tin.**—A net decline of ¾c. marks the week under review. Owing to heavy arrivals the market commenced to decline last Thursday, and the downward movement continued until Saturday. Since then it has remained about steady, and to-day the closing price is 26c. for spot and April, as against 26¼c. to 26.50c. of a week ago. Throughout the entire week the buying movement has been very slight, and the reduced price has had little effect outside of the Metal Exchange. The London market also declined, but a reaction brought the figures back almost to where they were a week ago. During the early portion of the week under review the London market declined £1, and since then a reaction of 10 shillings has been brought about. The closing price for spot to-day is £117 5s., and the future quotation is £114 15s. Arrivals here thus far this month amount to 2415 tons. There are 4219 tons afloat, of which about

600 tons will arrive before the end of this month. Early in May a steamer coming direct from the Straits will bring about 1000 tons.

**Copper.**—There is very little activity and no change in prices. While the controlling interests are still adhering to 17c. for Lake and 16½c. for Electrolytic, and are still saying that these figures are on a spot cash basis, a sale has just been made showing that the spot cash clause in the agreement is not followed strictly by all parties in the market. During the last week the Government bought 300,000 lbs of Lake at 17c., delivered in Washington, terms 45 days. The London market has fluctuated slightly and, on the whole, has advanced to a small extent. At the close to-day £70 11s. 3d. was quoted for spot and £71 2s. 6d. for three months' futures. Best Selected, however, declined 5 shillings and is quoted to-day £76 5s. Export business appears to be almost nil. Exports so far this month, and the month is pretty well advanced, amount to 3194 tons, against which the imports during the same period amount to 3146 tons. By deducting the latter from the former a net exportation of 48 tons is left.

**Pig Lead.**—The market is dull and unchanged. The American Smelting & Refining Company continue to quote 4.37½c. for Desilverized, f.o.b. New York, and 4.32½c., f.o.b. St. Louis. In London there was an advance of 12 shillings 6 pence during the early portion of the week, but within the last two days this advance was lost and the market closed weak at £12 5s., which is within 2 shillings 6 pence of the lowest price quoted this year. Final details were settled in the amalgamation of the American Smelting & Refining Company and M. Guggenheim's Sons by the election of officers, the new interest being well represented on the board.

**Spelter.**—Has been ruling somewhat firmer and closed to-day 4c. to 4.05c. for Spot and May. The demand is said to have picked up considerably. The London market advanced 7 shillings and 6 pence, closing to-day £17 2s. 6d. It is officially announced that the negotiations which have been pending for some time looking toward the consolidation of the New Jersey Zinc Company and the General Chemical Company have been terminated and the deal is declared off.

**Antimony.**—Is unchanged. Hallett's is quoted 8¼c. to 9c., Hungarian 8½c. to 8¾c., and Cookson's 10¼c.

**Nickel.**—Is unchanged, 55c. to 60c. being the lowest quotation for ton lots.

**Quicksilver.**—Is unchanged, prices quoted here are \$51 per flask of 76½ lbs. for lots of 50 flasks and more. The London market remains at £9 2s. 6d.

**Tin Plate.**—There is no change in quotation, and a steady demand for fair sized quantities is reported. The American Tin Plate Company still quote \$4.19 per box of Standard 100-lb. Cokes f.o.b. New York, and \$4 per box f.o.b. mills. Deliveries at these prices can be had until October 1.

The Niles Boiler Company, Niles, Ohio, some time since secured from the Youngstown Iron & Steel Roofing Company orders for practically all of the equipment of the new sheet mill being built by that concern, except the building, roll trains and engines.

We can state officially that the report that an Eastern syndicate had secured options on the iron and steel properties of Ashland Steel Company and Norton Iron Works, at Ashland, Ky., and Belfont Iron Works Company and Kelly Nail & Iron Company, at Ironton, Ohio, is untrue. The concerns mentioned have not given options on their plants.

A short time ago the Union Pacific Railway, while boring for water near Evanston in the extreme southwestern part of the State of Wyoming, struck a strong flow of oil. Samples of the oil sent East for analysis are said to show it to be a high grade of illuminating oil. There are thousands of acres of oil bearing land in the Evanston district, and a rush has set in which promises to cause a remarkable development of the region.



## The New York Machinery Market.

Office of *The Iron Age*, 232-238 William street, }  
New York, April 24, 1901. }

Machine tool merchants are joyous over the prospect of a final closing of several of the "big jobs" that have hung over the market teasingly for many months. The most noteworthy of these is the equipment for the new Manchester works of the British Westinghouse Company. That the representatives of the company have practically decided upon the tools to be purchased is very evident, and that the contracts will be placed during the next few weeks is assured. Managing Director Henry S. Loud, who has the matter in charge, and George Westinghouse sailed for England this morning, having tabulated all of the bids and received the necessary data relative to the purchasing of the new equipment. To a representative of *The Iron Age* Mr. Loud said: "My trip will be a short one, as I expect to be abroad but four weeks. Then I shall return to Pittsburgh. The only contract which has actually been signed so far was for about a dozen drill presses. It was awarded to Baker Brothers of Toledo, Ohio. Our equipment will be largely a duplicate of our Pittsburgh plant, and we have decided upon the types of tools which we desire. Since the building of our Pittsburgh works, however, there have been built abroad, and especially in Germany, a good many tools that are made on the same lines as the American tools. We shall be obliged to scatter our orders to a considerable extent, and therefore have taken these foreign built tools into consideration. No, there is no truth in the report that we have placed an order with the Lodge & Shipley Machine Tool Company for 107 lathes, for, as I stated, we have signed but one contract, and that was for the Baker drills. Just when and where the orders will be placed I cannot say now. But we shall commence ordering extensively within four weeks, and the orders will be given both from the London and Pittsburgh offices. Some of the contracts may be placed from Pittsburgh during my absence, as we have virtually decided upon the tools which we will purchase." It is estimated that these purchases will amount to almost \$1,000,000, and if a good proportion of the orders are placed with American firms the work will prove sufficient to aid materially in strengthening the situation.

Another important contract which is practically closed is the equipment for the new shops which the Central Railroad of New Jersey are erecting at Elizabethport, N. J. We are officially advised that it has been decided to place a blanket contract for the machine tools with Manning, Maxwell & Moore. While this course has been decided upon, the actual order has not yet been signed. Manning, Maxwell & Moore, it is said, will sublet contracts for such portion of the equipment as is to be purchased from the various builders. In this way they will act as brokers in the machine tool end of the deal. The engines have been ordered from Ball & Wood of Elizabethport. The Babcock & Wilcox Company will furnish the boilers, and the Sprague Electric Company will supply the generators and motors, as the machinery is all to be operated electrically. The Phoenix Bridge Company have secured the order for the turntables and Milliken Brothers are furnishing and erecting the iron work used in the buildings.

One change in prices was announced during the week. It was made by a large builder of boring mills and affected only the medium and smaller sizes of machines. The advance varies from  $2\frac{1}{2}$  to  $7\frac{1}{2}$  per cent., according to the size of the tool.

Another evidence of the great activity in the erection of sugar plants in Mexico and the West Indies is the advent of the Mexican Sugar Refining Company, who will build a \$500,000 plant in Mexico. The plant is to be built at Tlacotalpan, on the Papaloapam River. A contract for the erection and equipment of the entire plant has been awarded to J. B. & J. M. Cornell of this city. This concern are now subletting contracts for such portion of the equipment as they do not produce themselves. The plant is to have a capacity of 700 tons of cane or a production of 150,000 pounds of raw sugar

per day. Contracts have already been awarded for the boilers, two of the engines and the mills and crushers. There will be four 250 horse-power Sterling water tube boilers, and Corliss engines of 400 and 250 horse-power respectively, which will be furnished by the Birmingham Machine Company. The Birmingham Company are also to furnish the crushers and mills. The crushers will be 26 x 66 inches and there will be six roller mills of 32 x 66 inches. The sugar machinery will be furnished by J. B. & J. M. Cornell. There is to be an electric plant containing two Corliss engines of 200 horse-power each for furnishing both light and power. The pumps will be direct connected to electric motors, which will be rather an innovation. The centrifugals will also be electrically driven. There will also be a small repair shop, which is to contain a number of machine tools. About 150,000 pounds of tank work will be required. The company are capitalized at \$600,000. I. Heckinger is the president of the company and J. B. Craven is the vice-president.

Another large contract has just been awarded by the Manhattan Elevated Railway Company for equipment for their new electric power station, now building at Seventy-fourth street. The contract was given to Charles H. Paine of 85 Liberty street. It was for all of the expansion joints used in the exhaust piping leading from the low pressure cylinders to the atmosphere.

Some of the joints will be 42 inches in diameter. Mr. Paine was also awarded the contract for the 4000 horse-power Wainwright even flow feed water heater to be used in the new power station which is being built at the smelting plant of M. Guggenheim's Sons, Perth Amboy, N. J.

The boiler contracts for the three new plants to be erected in the Pennsylvania coal regions by the Delaware, Lackawanna & Western Railroad have been awarded. The contract for the Hampton colliery was awarded to the Babcock & Wilcox Company. There are to be 15 boilers in this plant, aggregating 4695 horse-power. The contract for the Dodge colliery was also awarded to the Babcock & Wilcox Company. In this plant there will be ten boilers of 313 horse-power each. The contract for the Woodward colliery was awarded to the Sterling Boiler Company and includes eight boilers aggregating 2530 horse-power. We are informed that McClave stokers have been purchased for these entire equipments.

It is reported in the street that the Aldrich Bleachery of Delewana, N. J., are purchasing the equipment for a 1500 horse-power boiler plant.

The Vandergrift Construction Company of Philadelphia are closing contracts for a large power station equipment for a new street railway plant to be erected at Newport News, Va.

Contracts are being placed by Mr. Le Doux of the American Pipe Mfg. Company of Philadelphia for a large electric generating station to be built for the National Gas & Construction Company, who are said to be affiliated with the former concern.

Although the plans for the Johnson Philadelphia-New York railway scheme are still very much in embryo, we are informed that an engineer in New Brunswick, N. J., has been retained to make surveys and arrange the preliminary plans for the project.

The contract for the pumping plant to be built in connection with the new Manhattan State Hospital at Central Islip, Long Island, was awarded to H. E. Maxfield, New York representative of the Lawrence Machine Company, 39 Cortlandt street. Mr. Maxfield also captured a large contract for centrifugal pumps to be installed in the plant of the Lodi Dry Dyeing Company of Passaic, N. J. He also received an order from a large corporation in York, England, for a centrifugal pumping plant to have a capacity of 120,000 gallons per minute. It is said that this order is to be duplicated for another English concern.

The Scranton Steam Pump Company of Scranton, Pa., have opened a branch office at 126 Liberty street. They will have ready for distribution in a few days a new catalogue of direct acting single and duplex electrical

and power pumps. They are desirous of opening correspondence with the trade in various cities where they are not at present represented, with a view of placing agencies.

The Turner Machine Company of Newark, N. J., who operate the plants of the Yule & Carley Mfg. Company and the Yule Machine Company, also of Newark, N. J., intend erecting a large new machine shop for the building of hatters' machinery. The two shops controlled by the Turner Company are to be consolidated under the new roof. The location for the new plant has not been decided upon, but plans are being prepared for a factory which will require considerable new machinery.

It is reported in the trade that the Steinway Piano Company are preparing plans for a new factory to be built in Brooklyn, N. Y.

The New York, New Haven & Hartford Railroad Company are still buying machinery for the equipment of their new car shops which are in course of construction at Readville, Mass. C. M. Ingersoll, Jr., the chief engineer of the road, whose offices are at New Haven, has the matter in hand.

Specifications have just been issued by the West Shore Railroad Company for the erection of the monster grain elevator which they have had in contemplation for some time for Weehawken, N. J. Assistant Chief Engineer Katte, whose offices are in the Grand Central Building, New York City, is in charge of the matter. Structural iron manufacturers are now figuring on the work. It is expected that the machinery equipment will soon be purchased. The elevator is to have a capacity of 3,000,000 bushels.

W. O. Fayerweather, president of the Passaic Rolling Mills, informs us that the extensions to the plant at Paterson consist principally of the installation of an electric plant, an extension to the melting furnaces which will increase the capacity of the plant 50 per cent., the installation of charging machines and some changes to the crane system of the shops. A contract covering the entire electric plant, which is to be of about 600 horsepower, has been awarded to the Crocker-Wheeler Electric Company. The changes on the cranes and the melting furnaces will be made by the Passaic Company themselves, and the charging machines are now being purchased. The bridge and machine shops have been extended and the machinery has been purchased from time to time during the last few weeks.

Contracts are being placed by the American Linde Refrigeration Company of 45 Broadway for a considerable quantity of pumping machines and the accessories to ice making and refrigeration plants. The company have a large lot of work on hand. They have just been awarded a contract from the Dealers' Hygeia Ice Company of Forty-ninth street and Twelfth avenue, New York, for a 75-ton ice making plant. They have also received contracts for a 30-ton plant for Dallas, Texas, and a 10-ton plant for Glasgow, Ky. They also have orders for a 10-ton refrigerating plant for the steamship "Grinada," now being built for the Trinidad Steamship Company and to cruise through the tropics, and for a 10-ton plant for Campbell Brothers of Danville, Ill. A 25-ton plant will be built by the Grand Rapids Cold Storage Company of Grand Rapids, Mich. Two very large refrigeration plants are projected; one is to occupy the site of the old appraisers' stores in New York and the other is to be erected in Jersey City.

**The Iron and Steel Production of France.**—The *Comité des Forges de France* publishes preliminary statistics of the production of iron and steel in 1900, and the final figures for 1899. The output of pig iron in 1899 was 2,578,401 metric tons, of which 512,464 tons are foundry iron. In 1900 the figures were, respectively, 2,699,494 and 540,033 tons. The district of *Meurthe et Moselle* produced in 1900 1,669,206 tons of the total. The total production of rolled iron was 833,856 tons in 1899, of which 609 tons were rails, 736,386 tons merchant bars and special shapes, and 96,861 tons sheets and plates. In 1900 the total production was 745,312, including 680,735 tons of bars and shapes and 63,956 tons of sheets and plates. Out of the total quantity of rolled iron,

477,716 tons were from puddled stock, 260,564 tons from reheating scrap and old material, and 7032 tons refined with charcoal. The total production of steel ingots in 1899 and in 1900 was 879,181 tons and 954,261 tons, respectively, of Bessemer, and 619,845 and 669,787 tons, respectively, of open hearth steel. The total production of rolled steel in 1899 was 1,239,660 tons and in 1900 1,264,737 tons. Of the latter, 667,002 tons was Bessemer, 561,665 tons open hearth, 8730 tons puddled steel, 947 tons cement steel, 16,796 tons crucible steel and 9597 tons rerolled from scrap steel. Out of the total rolled steel product, 295,915 tons was rails, 667,171 tons was merchant shapes, and 301,651 tons was plates and sheets.

## Trade Publications.

**Gas and Gasoline Engines.**—The Webster Mfg. Company, Western avenue and Fifteenth street, Chicago, have just issued catalogue H, describing the smaller Webster vertical gas and gasoline engines. The catalogue enters minutely into their construction, and contains views showing the engines connected to various devices and illustrating their action. The book also contains a number of testimonials from those who have used the engines.

**Elevating and Conveying Appliances.**—The Webster Mfg. Company, Western avenue and Fifteenth street, Chicago, have issued catalogue M, containing descriptions, illustrations and price-list of their lines of elevating and conveying appliances. The contents are very comprehensive, covering every character of conveying device and illustrating its application. This catalogue comprises 272 pages, is of convenient size, bound in cloth, and is the finest catalogue ever issued by the company.

An interesting publication, Bulletin No. 40, has recently been issued by the Chicago House Wrecking Company, West Thirty-fifth and Iron streets, Chicago. This Bulletin gives many particulars relative to the great variety of merchandise offered for sale by the company. The business which they conduct is of a unique character, being operated on original lines conceived by the managers. They have built very large warehouses, in which they store and classify all kinds of merchandise purchased in every part of the country from plants and buildings which are being dismantled and also from bankrupt establishments. They thus handle almost everything, from engines, boilers and machine tools to finished products in hardware lines, plumbers' supplies, electrical supplies, &c. They operate shops in connection with their warehouses, in which they overhaul and put in good order machinery and other merchandise. The Bulletin referred to contains a letter purporting to be written by a country visitor to his nephew, describing a tour which he made through the company's establishment and telling what he saw there. What he writes constitutes a revelation to any one not familiar with the extent and methods of this house.

**The Keystone Rolling Mill.**—PITTSBURGH, PA., April 24, 1901.—(By Telegraph.)—J. W. Rhodes & Co., Murtland Building, Pittsburgh, have leased the plant of the Keystone Rolling Mill Company, on Second avenue, Pittsburgh, for two years, and will take possession Monday, April 29. They may possibly buy the plant before the lease expires. The plant is equipped with a bar mill with a capacity for rolling about 100 tons a day, and a guide mill that can turn out 80 tons a day. The product will be iron and steel skelp in sizes ranging from 1½ inches to 15¼ inches wide. The output will be from 160 to 175 tons a day.

The London *Times*, this week, in a fourth article on "American Engineering Progress," arrives at the conclusion that the whole question of American superiority turns on "character." "The American is successful," says the writer of the article, "because he treats business as a science and follows it with the enthusiasm of a scientific devotee."



## QUOTATIONS OF IRON STOCKS DURING THE WEEK ENDING APRIL 24, 1901.

Cap'l Issued.		Thursday.	Friday.	Saturday.	Monday.	Tuesday.	Wednesday.	Closing quotations.	Sales.
\$10,000,000	Am. Bicycle Co., Com....	- 6½	6½- 7¼	.....	- 8	7¼- 8¼	7 - 7½	7	2,700
20,000,000	Am. Bicycle Co., Pref....	.....	29 -30¼	30½-31½	32½-35	33 -35	30 -32	30	3,400
	Am. Bicycle Co., Bonds....	-80	.....	-81	81 -81¼	81½-82	-82	...	119,000
29,000,000	Am. Car & Foundry, Com.	25½-26	25½-26½	25½-26	25½-26½	25½-26½	25½-25½	25½	12,300
29,000,000	Am. Car & Fndry, Pref.½	80½-80¾	80½-80¾	80½-80¾	79¾-80	-79¼	78¾-79¼	79¼	5,200
7,500,000	Bethlehem Ironf.....	.....	.....	.....	60½-60½	.....	.....	.....	10
15,000,000	Bethlehem Steelf.....	21 -21¼	21½-21¼	21 -21½	21 -21½	20¾-21½	21½-21½	21½	5,442
7,974,550	Cambria Iron, Phila.*....	.....	45½-46	46 -46½	46½-47½	-47	.....	.....	2,065
16,000,000	Cambria Steel**.....	23¼-24	23 -23½	23¼-24	23¾-27¾	23 -23½	23 -23½	23	58,126
11,000,000	Colorado Fuel & Iron....	88 -93	91½-95	94½-97	96 -99	93½-98½	93 -96	94¼	39,400
24,410,900	Crucible Steel, Com.....	-25½	26½-27	-27	-26¾	.....	-26½	26½	2,100
24,399,500	Crucible Steel, Pref.....	.....	.....	.....	.....	.....	.....	.....	.....
	Diamond State Steel....	6½- 6¾	6½- 6¾	6½- 6¾	6½- 6¾	6½- 6¾	- 6¼	...	31,900
15,000,000	International Pump, Com.	39¼-40½	39¾-40¼	-40	38 -40	38¾-39	38¾-39	38¾	4,300
12,500,000	International Pump, Pref.	-81¼	-82½	.....	-81½	.....	81½-81¼	81¼	700
11,000,000	International Silver.....	.....	- 6½	.....	.....	.....	- 6	6	200
5,000,000	Penna., Com., Phila.....	.....	.....	-85¾	.....	-85	.....	...	400
1,500,000	Penna., Pref., Phila.....	.....	.....	.....	.....	.....	.....	.....	.....
12,500,000	Pressed Steel, Com.....	45½-46¾	45 -46½	46½-47¼	46½-47	45 -45½	45 -46¼	46¼	11,300
12,500,000	Pressed Steel, Pref.½....	84¼-84¾	84 -84¾	.....	83½-84	82¾-83¾	82½-82¾	82½	2,000
27,191,000	Repub. Iron & Steel, Com.	20 -20¼	20¼-21¼	20½-21	20½-20¾	20¼-21¾	20½-20¾	20½	16,600
20,306,900	Repub. Iron & Steel, Pref.½	76 -76¾	76½-77½	77¼-77½	77 -77½	76½-77½	75½-76½	76	8,200
7,500,000	Sloss-Sheffield S. & I., Com.	35½-36	37 -38	.....	36½-38	36½-37	-38	38	1,400
6,700,000	Sloss-Sheffield S. & I., Pref.½	-84	.....	83¼-84½	.....	-84	.....	...	800
20,000,000	Tennessee Coal & Iron....	66½-69½	68 -69	67½-68½	66½-68½	66 -68½	64¼-67¼	65	49,300
	Tidewater Steel.....	8 - 8¼	8¾- 9½	9 - 9¼	- 9	8½- 9	.....	8½	8,535
	U. S. Steel Co., Com.½....	45¾-47¼	46½-47¾	46¼-47¼	45¾-46¾	45½-47¼	45½-46¾	46	531,900
	U. S. Steel Co., Pref.½....	93¾-94¼	93¾-95½	94¾-95	93¾-94½	93¾-95	93¾-94¾	93¾	278,300
1,500,000	Warwick I. & S. (par \$10)	.....	.....	7 - 7½	7 - 7¼	7 - 7½	- 7½	...	1,925

½ 7% Non-Cu. ¼ 7% Cu. ½ Par \$50, \$1 paid in. ½ Authorized Capital \$550,000,000 Common; \$555,000,000 Preferred; \$304,000,000 bonds. \* Par \$30. \*\* \$10.50 per share paid in. † 6% guaranteed by Beth. Steel Co. Late Philadelphia sales by telegraph.

**Bonded indebtedness:** Am. S. & W., \$180,656; Am. Tin Plate, none; Am. Steel Hoop, none; Cambria Iron Co., \$2,000,000 6% debenture 20-year bonds, 1917, payable option 5 years, assumed by Cambria Steel Co.; Federal Steel Co., \$9,822,000 Illinois 5%, \$7,417,000 E. J. E. R. 5%, \$1,600,000 Johnson 6%, \$6,732,000 D. & I. R. R. 5%, \$1,000,000 2d D. & I. R. R. 6%, \$10,000 land grant D. & I. R. R. 5%; National Steel, \$3,561,000 6%; National Tube, none; Tennessee C. & I. R. Co., \$8,367,000 6%, \$1,114,000 7%, \$1,000,000 7% cu. pref.; Pennsylvania Steel, \$1,000,000 5%, Steelton, 1st, 1917, \$2,000,000 5%; Sparrow's Point, 1st, 1922, \$4,000,000, consolidated, both plants; Bethlehem Iron, \$1,351,000 5% maturing 1907, interest and principal guaranteed by Bethlehem Steel Co. Republic Iron & Steel, none; Warwick Iron & Steel, none; Colorado Fuel & Iron Co.; Col. Fuel Co. Gen. Mort. 6% \$880,000, Col. Coal & Iron Con. Mort. 6% \$2,810,000, Col. Fuel & Iron Gen. Mort. 5% \$2,308,000. Also outstanding \$2,000,000 preferred stock on which dividends have been paid to June 30, 1900. Sloss-Sheffield St. & I. Co., Sloss I. & S. first mortgage 6%, \$9,000,000, Sloss I. & S. general mortgage 4½% \$1,835,000.

## Iron and Industrial Stocks.

It is semiofficially announced that the managers of the United States Steel Corporation do not for the present propose to take additional properties. Since the purchase of the one-sixth Oliver holdings for \$9,000,000 each in common and in preferred no important transactions have taken place. It is reported that the offer of the Cleveland-Cliffs Company for their mines was coupled with so many conditions that it could not be seriously considered. It did not include the railroad, which was to have the benefit of a ten-year contract for hauling all of the corporation's ores in the district for ten years, while the present management of the mines was to be in practical control of them for a like period. The transfer, too, was not to include the furnaces, nor the estate outside of the small area in which the going mines are located.

Parties in control of one of the large Southern steel companies state that they have not been approached in any way by representatives of the United States Steel Corporation, and it is generally believed in the trade that there is no foundation for the reports current.

Insiders are credited with the statement that the earnings of the United States Steel Corporation in March reached \$9,000,000.

There was a heavy trading in the United States Steel stock during the whole of the week, but the movement in the price was not large.

Colorado Fuel has gained largely during the week. The market for Cambria Steel has quieted down and only a moderate volume of business has been done in Bethlehem Steel.

E. W. Bliss, common.....	130	..
E. W. Bliss, preferred.....	125	..
Dominion Iron & Steel Company.....	38	..
Empire Iron & Steel, common.....	5	9
Empire Iron & Steel, preferred.....	39	45
National Enam. & St., common.....	23	25
National Enam. & St., preferred.....	83	85
New Haven.....	4½	5
Otis Elevator, common.....	34½	35
Otis Elevator, preferred.....	93	94
U. S. Cast Iron Pipe Company, common.....	8½	9½
U. S. Cast Iron Pipe Company, preferred.....	40	41
U. S. Projectile.....	114	..
Va. C. I. & C., stock.....	8	8½
Va. C. I. & C., bonds.....	54	56
H. R. Worthington, preferred.....	112	116

A special meeting of the Diamond State Steel Company stockholders has been called for April 30, at Wilmington, to vote for or against the sale and conveyance to The Diamond State Steel Company of all the former company's property and good will, in accordance with the reorganization plan issued by E. B. Smith & Co., March 15, 1901, and for or against granting the necessary authority to the board of directors for this purpose.

**Dividends.**—The National Fireproofing Company, on Monday, April 22, declared an initial quarterly dividend of 1¼ per cent. on the common stock, thus placing it on a 5 per cent. basis. The dividend is payable May 15. The regular quarterly dividend of 1¼ per cent. on the preferred stock was also declared, payable May 25. There is but \$623,500 preferred and \$500,000 common stock outstanding, although \$1,000,000 of each is authorized.

The exports from the United States for the nine months ended March 31, 1901, made a new record for that period, aggregating \$1,140,170,728 and exceeding by \$86,540,032 the total for the similar period of last year, which was the highest mark heretofore. The imports for the nine months reached a total of \$599,483,391, which was a falling off of \$42,292,639 from those of the corresponding period last year, leaving a balance of trade in favor of the United States of \$540,687,337. For the month of March the exports aggregated \$124,975,744, or less by \$9,181,481 than those for March, 1900, and the imports were \$75,949,088, a falling off of \$10,573,368.

The city of Utica, N. Y., is now provided with electric power for lighting and the operation of street cars and industrial establishments, generated at Trenton Falls on the West Canada Creek, 14 miles north of the city. The work has taken two years. The installation consists of six turbines, four of which are of 1100 horse-power each and two of 1000 horse-power each.

The London *Daily Mail* asserts that the managers of the Metropolitan District Railway of London have decided to adopt the electric traction system used by surface lines in this country.

## The Philadelphia Machinery Market.

Office of *The Iron Age*, Forrest Building, {  
PHILADELPHIA, Pa., April 22, 1901. }

There has been no diminution in the volume of trade in the Philadelphia machinery market during the past month. The same general activity pervades all branches of the trade, and an active summer is practically assured. Many manufacturing concerns have their order books so well filled that the year's output has already been covered, and orders are being taken with care and for extended delivery only. Inquiries are numerous and generally satisfactory, although in some few lines there has been a slight falling off; but in such cases they seem to lead up to business more readily, so that no complaints are being heard.

The foreign demand drags. Some manufacturers still do a certain amount of export business and will no doubt continue to do so, as the trade appears to run only in special lines. A general resumption of foreign trade, however, still appears distant. The various foundries continue busy and some hardening in deliveries is becoming noticeable. There has been no change in the demand for heavy machine tools, compression machinery, &c., and early deliveries in these lines continue to demand a premium over current prices. Trade in the smaller machine tools has increased during the past month. A number of the manufacturers have their order books well filled, and in some cases are being rushed in order to make deliveries. Inquiries and sales among the manufacturers and dealers in the smaller engine, boiler and general supply trade have been numerous, and a very satisfactory condition of this branch of the business can be noted.

Prices generally are unchanged, but have hardened materially, and the tendency in some lines to underbid has disappeared. Premiums, however, are still being demanded for quick deliveries.

The Midvale Steel Company continue very busy in all departments of the works. Several notable improvements to the plant are about to be made. A new foundry building, about 250 x 95 feet and three stories high, will be built, and an addition 577 x 80 feet, three stories high, will be made to ordnance machine shop No. 2. A 75-ton yard crane is also to be erected.

The Hess Machine Company, manufacturers of file making and special machinery, continue busy. A large number of machines for export are now building, and the conditions of trade are considered very favorable. Recent shipments include seven sets of file making machines for export to Hamburg, Germany, and five sets for delivery in France.

The Lodge & Shipley Machine Company, Philadelphia branch, report an active trade in all lines of their machine tools. Inquiries are of good volume, and a number of lathes and planers have been delivered to local and nearby parties. A favorable trade is also reported in Reeves' variable speed pulleys.

Thomas H. Dallett & Co. have delivered a number of their portable drills to various local parties and several have been shipped to out of town concerns. Inquiries are of fair volume, and some very satisfactory bookings of orders have been made. Altogether the indications for future trade are considered excellent.

The Philadelphia Machine Tool Company, who have recently established an agency for the sale of their machine tools with the S. M. York Company, Cleveland, Ohio, report a very active condition of trade. Inquiries are of good volume, and a number of orders have been placed on the books. These include several for their special and geared presses, and for a new small high pressure hydraulic, special single or double acting pump. Among recent shipments may be noted a number of No. 1 and No. 2 shears, and a large multiple punch for local delivery.

I. H. Johnson, Jr., & Co., report a fair volume of inquiries with good resultant orders. A large amount of work is on hand and all departments are kept busy. Among recent shipments may be noted a 66 inch by 30 foot lathe for the gun carriage shop of the Washington navy yard, this being the second 66-inch swing lathe

installed in this shop by them. A long 30-inch lathe has also been delivered to the American Ordnance Company, Bridgeport, Conn.

The plant of the Pedrick & Ayer Company is being operated to its utmost capacity in order to meet the demands of their large trade. Inquiries have been voluminous and a number of orders have been secured. Shipments of various machines and tools are being made to all parts of the country.

Dienelt & Eisenhardt maintain their usual activity. Inquiries and orders are numerous, and a very satisfactory condition of trade is reported. The foundry department is busy. Considerable work in dead stroke hammers and hydraulic jacks is under way, and numerous shipments are being made to local and other parties.

Alfred Box & Co., manufacturers of cranes, hoists, &c., report business in an excellent condition. Inquiries have been active and some very satisfactory orders have been booked. Among recent shipments may be noted a 5-ton hand power crane for the American Steel & Wire Company, Pittsburgh, Pa., and one each of the same capacity for Hunter & Dickson, Philadelphia, Pa., and for the Fawcus Machine Company, Pittsburgh, Pa. A 6-ton hand power crane has also been delivered to the Philadelphia Roll & Machine Company, Philadelphia, Pa.

The American Pulley Company report a favorable condition of trade. Inquiries are plentiful, and considerable new business is being taken. All wrought steel pulleys are now being made up to and including 30 inches diameter, and it is expected that larger sizes will be ready for the market in the near future. The American Pulley Company have recently placed on exhibition in the machinery department of the Philadelphia Bourse a complete line of their pulleys, including sizes up to 24 inches in diameter. Foreign demand remains fair, a large shipment having recently been made to London, England, for distribution. Heavy shipments of pulleys have also been made to Chicago and San Francisco.

The Link-Belt Engineering Company are fairly busy on a general line of work. Inquiries are of fair volume, with some good business in sight, and the prospects for a good season's trade is considered favorable. Owing to the crowded condition of the truss shop, a one-story addition, 67 x 50 feet, is to be erected.

The Baldwin Locomotive Works are running their plant to its full capacity. Domestic inquiries are active and a number of orders are being taken. One order for 165 engines for the Baltimore & Ohio road has been completed, and work on another order for 55 engines has been started. Ten passenger engines and a number of freight engines have been delivered to the Philadelphia & Reading Railroad, and a recent shipment for export was composed of 20 compound locomotives for the West Australian Government. These were transported by the steamer "Tripoli" from New York.

The Wm. Cramp Ship & Engine Building Company launched on the 18th inst. the twin screw steamship "Monterey," a sister ship to the "Esperanza," which was launched early in February. These vessels are building for the New York & Cuban Mail Steamship Company. The "Monterey" measures 341 feet on the water line, 47 feet beam, and 36 feet light draft. Triple expansion engines with 4500 horse-power boilers will furnish the power for the screws. The "Monterey's" tonnage is 4702 gross and 2948 net tons, and both vessels must have a continuous sea speed of 16 knots per hour. The Cramp Company are extremely busy in all departments, all of which are being operated to their fullest capacity.

Continued activity is to be noted at the yards of the Nease & Levy Ship and Engine Building Company. The keel for the pilot boat for the Galveston (Texas) Pilots' Association has been laid, and the keel for a tugboat for the South Atlantic Towing Company, Brunswick, Ga., will be laid in a few days. In the machine shop, work upon the boilers and engines for a wooden hull tugboat for Boston, Mass., and a tug for Wilmington, Del., parties has been begun. Work on the Government



torpedo boat destroyers and the cruiser "Denver" is progressing rapidly.

The Royersford Foundry & Machine Company, Royersford, Pa., who have recently established an agency for the sale of their lines of machinery, &c., in Pittsburgh, Pa., with J. W. Carlin Company of that city, report a very active condition of trade. All departments of their works are being run on full time, with a full complement of men, and the prospects for a prosperous year have never been better. Among recent shipments may be mentioned one No. 3 combined punch and shear to the J. W. Carlin Company, Pittsburgh, Pa.; one No. 1 special double shear to the Anthracite Separator Company, Catasauqua, Pa.; a No. 2 combined machine to the Bryden Horse Shoe Company, Catasauqua, Pa., and a No. 2 combined machine to the Prentiss Tool & Supply Company, New York.

### The Cleveland Machinery Market.

Office of *The Iron Age*, The Cuyahoga, }  
CLEVELAND, OHIO, April 22, 1901. }

According to the majority of Cleveland machinery manufacturers and dealers the market for machine tools, especially that of this section, is in a fair condition, neither booming as compared with last year at this time nor showing a marked decline. Many report that inquiries are very strong, indicating that many improvements are contemplated, but it appears that there are a number of retarding influences which are holding up a large amount of business. One manufacturer attributes the holding off tendency to the spirit of speculation which is rampant in all sections of the country. He figures that many manufacturers are withdrawing capital from their business and are taking advantage of numerous investments offered them. As an indication of this, collections are said to be much slower than was the case last year at this time.

But a still greater depressing influence comes from the labor situation. The settlement of the threatened difficulties with the employees of the United States Steel Corporation has brightened matters somewhat, but the impending troubles with machinists are being discussed by every one with more or less pessimistic feeling. Some of the manufacturers when interviewed claim to feel confident that there will be no trouble in this city, the general opinion expressed being that the failure of the strike last year, together with the severe lesson taught in the settlement of the molders' strike this year, will keep the men at work, but there is an air of preparation shown in the disinclination to take large contracts and the tendency to finish up those on hand with all possible haste, which indicates a desire to be on the safe side. So far as can be learned, the local manufacturers have not yet received the request for the nine-hour day and increase, which has been heard from in some parts of the country, but machinist leaders here say there will probably be a strike, and President O'Connell of the union has been quoted as saying that the Cleveland branch will probably be one of those called out on May 1. The National Manufacturers' Association now have but three members in Cleveland, so that their action in granting the demands will have but little effect on the situation. It is a foregone conclusion that the Cleveland Manufacturers' Association, which has been holding frequent meetings and which is now much stronger than a year ago, will not accede to the demands.

The sale of second-hand machinery is said to be considerably better than with new machinery and there is an unprecedented demand for heavy second-hand tools, sales being practically limited to the supply.

There are a number of projects hanging fire which will require large installations of power equipment, this being particularly true among electric railway projects, a number of which are in the hands of local people and will be closed up in the near future. It is said that some of these roads which have not yet ordered rails are finding it difficult to secure deliveries before late next fall, and this fact will have a tendency to hold off the purchase of power equipments. Several railway projects

have recently made heavy purchases of equipment from local representatives of manufacturers.

The Cleveland Punch & Shear Company notice no indications of a falling off in the amount of their business; in fact, orders for tools of the largest sizes appear to be more numerous. Among other large contracts they have recently received the following: Columbia Bridge Company, Pittsburgh, one bending and straightening machine, a 12-inch horizontal punch, No. 2 metal saw, 36-inch coping punch; M. Guggenheim Sons, New York, for export to Mexico, two splitting shears; the William B. Pollock Company, Youngstown, a 30-inch throat punch, heavy style, weight 40,000 pounds; the Ritter-Conley Mfg. Company, Pittsburgh, a set of 7-foot straightening rolls; the U. Baird Machinery Company, Pittsburgh, for the Boston Navy Yard, a No. 5 angle shear mounted on circular base; the Honolulu Iron Works, Honolulu, Hawaii, four 9-inch high speed punches, one 12-foot radial drill; the Cleveland City Forge & Iron Company, one No. 6 bar shear capable of cutting 5-inch billets. Recent shipments were as follows: The Columbia Chemical Company, Pittsburgh, for Barberton plant, one set 6-inch bending rolls; McClintock-Marshall Construction Company, Pottstown, Pa., one rotary planer, 50-inch head; Parke & Lacy Company, San Francisco, Cal., one 30-inch throat punch; the Ohio Cultivator Company, one gate shear, weight 32,000 pounds.

The Chisholm & Moore Mfg. Company have recently made the following sales of pneumatic and hand power cranes: Two 10-ton hand power cranes to a Massachusetts concern, one 15-ton hand power crane to a Dayton concern; one 15-ton pneumatic crane, two 10 ton 55-foot span pneumatic cranes and two 5-ton 25-foot span pneumatic cranes to Pittsburgh parties; one 10-ton jib crane to an Erie concern; one 10-ton 50-foot span pneumatic crane to a Pittsburgh party; two 10-ton jib cranes to Des Moines, Iowa, and one 20-ton hand power crane to Dayton parties. They report a strong demand for portable pneumatic hoists and chain hoists. They are making a 70 x 105 foot addition to their crane erecting room.

The Garry Iron & Steel Company, who were until recently known as the Garry Iron & Steel Roofing Company, have recently received orders for cranes from the New York Central Railway, the Pressed Steel Car Company of Pittsburgh, and the Russel Wheel & Foundry Company of Detroit. They are building two large soaking pit furnaces and eight ladles for the Wellman-Seaver Engineering Company to be installed in the plant of the Lake Superior Power Company at Sault Ste. Marie, Ontario. They report a very heavy demand for structural iron work and are at work on several large contracts.

The Lake Shore & Michigan Southern Railway Company have completed plans for their large repair shops to be erected at Collinwood, near Cleveland, designed to take care of all their repair work between Toledo and Erie. There will be a locomotive shop 530 x 245 feet, of steel construction, and a blacksmith and car machine shop 440 x 80. Specifications are being sent out and bids will be asked for as soon as possible. There will also be a store house 300 x 60 feet, two stories, and a power house 80 x 130 feet. The equipment of the latter will consist of 1800 horse-power of boilers with engines to correspond, one 400-kw. direct current generating set, one 80-kw. direct current generating set and one air compressing outfit of 1300 cubic feet capacity. Bids will be asked for in the near future on the two buildings and the equipment mentioned. The latter will be increased later, as all machinery will be electrically driven. A large amount of machinery will be required, but bids will not be called for for some months. They have placed a contract with the Philadelphia Engineering Company for cranes as follows: One 100-ton, one 30-ton, one 10-ton and one 7½-ton electric cranes.

The Brown Hoisting Machine Company have completed plans for their new plant to take the place of the one which was destroyed by fire some months ago, and contracts for the buildings will be closed in the near future. The main shop will be 500 x 312 feet, of saw

tooth roof construction, making in reality seven buildings, the center one higher than the others, but with no partitions between. The present office building, a four-story brick and stone, the only building saved from the fire, will be removed about 300 feet south to face on St. Clair street, where it will be enlarged and connected with the main plant. The power house will be an independent building. The equipment will consist of generators of 750 kw. capacity with engines and boilers in proportion; all machinery will be electrically driven. The company have recently purchased a number of machine tools which have been installed in temporary buildings, and as much of the damaged machinery is being repaired, comparatively little will be required when the new plant is completed.

The local offices of the Buckeye Engine Company, Salem, Ohio, which are now located in new offices at 811 New England Building, have recently taken contracts for two 250 horse-power tandem compound direct connected engines for the plant of the Iroquois Portland Cement Company, Caledonia, N. Y., which is being designed by the Wellman-Seaver Engineering Company, and a 250 horse-power slow speed direct connected simple engine for the American mill of the American Steel & Wire Company. They are furnishing a 600 horse-power tandem compound engine to the National Screw & Tack Company of this city who are designing a new power plant. It is understood that Babcock & Wilcox boilers will be installed and that generators have not yet been contracted for.

The Variety Iron Works Company have placed a contract for a 300 horse-power slow speed simple Buckeye engine for a new power house. It is understood that boilers and generators have not yet been contracted for. They are erecting a new addition 100 x 200 feet at their East End plant and they are now occupying a handsome three-story office building which has just been completed.

The local office of the Babcock & Wilcox Company have recently sold a 400 horse-power boiler to the Cleveland Cap Screw Company, who are occupying the plant of the Grant Tool Works. They report several large contracts in sight in this city, two for 1000 horse-power each will be closed up in the near future.

Captain Levi Schofield, who is preparing to erect a 14-story office building, has placed a contract with T. H. Brooks & Co. for about 1400 tons of structural material. About 600 horse-power of boilers and three engines and generators of 150 horse-power each will be required.

The S. M. York Machinery Company, leading dealers, are preparing to remove to larger quarters on St. Clair street, near Ontario street. They have recently taken up new lines as follows: Becker-Brainard Company, Hyde Park, Ill., vertical milling machines; Hendee Machine Company, Torrington, Conn., lathes, shapers and milling machines; Philadelphia Machine Tool Company, Philadelphia, punch presses, drop hammers and bending rolls, and the Draper Machine Tool Company, Worcester, Mass., lathes and boring mills. They have recently sold three New Haven lathes, three Ohio planers and several other tools to the Kilby Mfg. Company, who are buying a number of machine tools to be installed in the various beet sugar plants which they are building.

The American Steel & Wire Company have been buying a number of machine tools for their plants in this district. The S. M. York Machinery Company have sold them a 5-foot radial drill, a No. 3 La Blond universal milling machine and a number of other tools, and the Marshall & Huschart Machinery Company secured a good slice of the contract which was distributed among a number of manufacturers and dealers.

The Reade Machinery Company, who will be incorporated this week with \$25,000 paid in capital stock, have taken over the machinery business of Wm. A. Reade & Co. The latter firm will continue to purchase and sell complete manufacturing plants. Both concerns are now located in fine suites of offices on the fourth floor of the American Trust Building. The officers of the Reade Machinery Company are: Wm. A. Reade, president; W. W. Blair, vice-president; H. R. Drury, secretary-

treasurer, all well known in the trade. They will give special attention to the sale of heavy second hand machinery and will carry a line of large blowers, engines, planers, lathes, punches, presses, &c. They have a large warehouse at Mason street and C. & P. Railway, and are mailing a catalogue describing and illustrating a large line of tools now on hand. They are also preparing to engage in the manufacture of a new line of heavy machine tools, formal announcement of which will be made in the near future. They are on the market for a set of heavy bending rolls, 10 to 12 feet long, also for a heavy 20-foot plate planer to plane side and end at one time.

The Acme Machinery Company, manufacturers of bolt and nut machinery, state that the three months ending April 1 were the best in the history of their business, being a considerable improvement over corresponding months of last year. In their bolt heading department they are 30 days behind, while in the bolt cutting and nut machinery departments they are catching up with orders. The prospects are so encouraging that they are placing contracts for the addition of two stories, 140 x 60 feet, to their machine shop. This week they are shipping two of their largest size bolt heading machines, weighing 25 tons each. One of them goes to Belgium and the other to an Eastern concern.

George H. Bowler, 513 New England Building, has had shipped to his Cleveland warehouse the complete machinery equipments of the Buffalo, North Buffalo, Fay and Christy plants of the American Bicycle Company. Mr. Bowler states that the demand for second hand machinery is greater than at any time in his experience. Last month his sales amounted to more than \$30,000, nearly all small tools. He recently sold a new 8 x 20 foot planer to a Milwaukee engineering concern.

A large number of electric railway projects which are promoted by local people will soon assume tangible form and several of them have recently done so. E. P. Roberts & Co., engineers for the Northern Texas Traction Company, who are promoted by Cleveland parties, have closed contracts for the equipment of the power house at Dallas. It will consist of two 600-kw. alternating current generators, two 300-kw. rotary transformers, two 400-kw. rotary transformers, all of Westinghouse make, and two 900 horse-power Cooper Corliss cross compound engines. The Aurora, Elgin & Chicago Electric Railway Company, also promoted by local people, have placed contracts for four 2200 horse-power Cooper Corliss engines, 8000 horse-power of Edgemore boilers and General Electric Company's generators. R. Rosenstock & Company are designing the power house for the Findlay & Southwestern, in which they are interested; the Osborn Engineering Company are designing the power house of the Cleveland & Southern Electric Railway, and E. P. Roberts & Co. for the Columbus & Southern Electric Railway, also for an addition to the power house of the Northern Ohio Traction Company at Akron.

The McMyler Mfg. Company, manufacturers of hoisting and conveying machinery, who are building a new plant at Warren, have placed a contract with the Fort Pitt Bridge Works of Connellsville, Pa., for structural iron work. They have not yet contracted for engines, boilers, &c., or for machinery. They are very busy on general work and are building a number of derricks for Pittsburgh parties. It is stated that the McMyler Company have taken an option on a large plant in this city which if purchased will be operated in connection with the Warren plant, for general repair and job work.

The Danielson Machine Tool Company have brought out a new line of presses which they will build in several sizes. They are furnishing a complete equipment of heavy presses and special dies for a large stove manufacturing plant in Illinois.

The Cleveland Elevator Bucket Company are furnishing a grain handling outfit of 1300 buckets for a new elevator being built by Barnett & Record of Minneapolis for the Cleveland Grain Company in this city. Also 800 buckets for a Columbus elevator.

C. O. Bartlett & Co. are erecting a coal handling outfit of 500 tons hourly capacity for loading vessels. It will be installed on the docks of the Pittsburgh Coal



Company at Fairport, Ohio. They are on the market for a 50 horse-power hoisting engine for the outfit.

The local office of Henry R. Worthington has been awarded a contract for a 4,000,000 gallon triple expansion water pumping engine for the Alliance, Ohio, water works department. The contract price was \$9195.

The Cleveland Brass & Iron Bedstead Company, who were burned out some time ago, are rebuilding the old plant of the Garry Iron & Steel Company, which they will occupy. They have contracted for new power and are in the market for two drop hammers.

The Garrett-Cromwell Engineering Company, prominent engineers, have been incorporated with \$100,000 capital stock by William Garrett, J. C. Cromwell, H. W. Lash, W. F. Carr and J. E. Mosley.

George F. McKay and others of the city are preparing to erect a large storage warehouse 250 x 200 feet and five stories high. It will be of steel and thoroughly fire proof and will be equipped with power and appliances for handling heavy goods.

The Pennsylvania Railway Company are preparing plans for the erection of a machine shop on Whiskey Island, this city. New machinery will be required.

The village of East Liverpool, Ohio, is securing figures on a 4,000,000 gallon pumping engine for its water works station.

## CORRESPONDENCE.

### The Russian Tariff on Machinery.

*To the Editor:* We do not look upon the decision of the Board of General Appraisers as a victory for the Government, nor are we discouraged by this decision.

The opinion of Colonel Titchener that the Russian law cannot be construed as paying a bounty on the exportation of sugar is undoubtedly correct, and his written opinion indicates a thorough insight into the whole subject. The two other members of the board have decided that the remission of an excise tax shall be regarded as a bounty and that the measure of this bounty is the value of the Russian sugar certificate of exportation.

Secretary Gage has never claimed that the remission of an excise tax is a bounty. On the contrary, the United States Government, through Assistant Secretary Howells, issued an official order in 1898 to the effect that the remission of a tax does not constitute a bounty, so that this majority decision of the Board of Appraisers is against the Government on this point. It is gratifying to know that this question, which is so complex, has by this majority decision been brought to a simple question, Does the remission of an excise tax constitute a bounty?

The case will go to the courts and I believe that this decision will be reversed. Nothing is settled that is not right, and it is our purpose to carry the case through all the United States courts, to Congress and to the American people.

The remission of an excise tax does not give anything to the sugar exporter which would enable him to reduce the cost of his product. It is not a bounty or grant by a Government, but it is evidence of the fact that the Government takes nothing from the exporter which might put him at a disadvantage when compared with other nations. There is not to my knowledge a single Government which fails to remit excise taxes on exportation. Our own Government does this to a very large extent. Spirits, tobacco, iron and steel products and such things receive on exportation either a remission of the entire revenue tax or drawbacks representing payment to the United States Government on the importation of articles used in the manufacture of exported product.

The purpose of section 5 of the Dingley Tariff act, establishing a countervailing duty, clearly did not involve the remission of an excise tax, and if the United States Government officially sustains the decision of the Board of Appraisers in collecting a countervailing duty because a foreign Government remits its excise charges, it follows that our own exports are thereby subject to

duties and we put a barrier upon foreign trade in which no Government suffers so much as the United States.

There is no one factor in the business situation in the United States so important at the present time as that of exports. We can produce more than we can consume, and it is unfortunate that just at this period so strained an interpretation should have been placed upon one of our laws. In the meantime trade with Russia in products of iron and steel is almost prohibitive.

W. L. SAUNDERS.

26 CORTLANDT STREET, NEW YORK, April 23, 1901.

### The Trenton Falls Power Plant.

The new power installation at Trenton Falls has been tested. The plant is designed to supply electric current for light and power purposes in Utica, 12½ miles from the station, and it has been constructed under the supervision of William A. Brackenridge of Niagara Falls, who is the company's consulting engineer. The officers of the Trenton Falls Power Company are: William E. Lewis, president; H. D. Pixley, vice-president; D. N. Crouse, second vice-president; M. Jesse Brayton, treasurer and general manager; Horace B. Sweet, superintendent; Thomas F. McKeough, chief engineer. In the construction Harry Hageman of Niagara Falls represented Mr. Brackenridge.

The company's plans contemplate a development of 5800 horse-power, which capacity may be doubled. The essential features of the development are a large dam to form a storage reservoir; a flume or pipe line to carry the water to the turbines, and a power house. The dam is 60 feet high, 228 feet long, 52 feet wide at the base, tapering to 8 feet at the top.

Near the bottom of the dam are eight gates 5 feet in diameter. Two of these allow the water to flow into the flume for use at the turbines, while four of the others will carry off the water in times of flood. The flume leading from the reservoir to the station is 3800 feet long, the first 2800 feet being built of Texas pine bound with ¾-inch iron rods. The remaining section of the flume is of steel pipe. The flume runs along the right bank to a point immediately over the power house, where it empties into a stand pipe 180 feet high, which height is 20 feet above the top of the dam, the purpose being to relieve any excessive pressure due to water hammer. Opposite the power house the pipe drops vertically over the cliff 90 feet, the bottom resting on a massive piece of iron. Connection is made with a receiver anchored on a concrete foundation and having four 48-inch outlets, each one of which will deliver water to a turbine under a total head of 264 feet. Valves controlled by a clutch and operated by a 15 horse-power Pelton water wheel make it possible to turn the water on or off from any of the turbines. Each of four turbines is of 1700 horse-power capacity, while there are also two turbines of 100 horse-power each. The turbines were made by the I. P. Morris Company of Philadelphia. The large turbines operate four 1000-kw. alternators, the current from which is three-phase, 2200 volts. The small turbines operate the exciters. The electrical equipment was supplied by the General Electric Company.

The transmission line from the station to Utica runs in almost a direct line, the poles carrying three No. 2 wires forming one three-phase circuit. Three additional wires are soon to be strung. For transmission purposes the voltage of the current is raised to 22,000. The transmission line follows a private right of way. The company have purchased sites for additional reservoirs, the water from which can be fed to the turbines as required. When all the water storage facilities of the company are completed it is understood that they will have a sufficient water supply to last from two to three months.

It is probable that the headquarters of the Tin Workers' International Protective Association will be removed from Elwood, Ind., to New Castle, Pa. It is stated that the latter place is more centrally located.

### The Columbia Coke Company.

(By Telegraph.)

PITTSBURGH, PA., April 24, 1901.—The Columbia Coke Company have been organized at Pittsburgh with a capital of \$200,000, all of which has been paid in. The new company have acquired some very fine coking coal in the Klondike district of the Connellsville region, adjoining the Bessemer Coke Company property at their Griffin Works, near Masontown. The Columbia Coke Company will put up at present 100 coke ovens and will be more or less closely identified with the Bessemer Coke Company. W. Y. Humphreys is president, F. A. Griffin of the Columbia National Bank vice-president, and Herman Griffin is secretary and treasurer. Mr. Humphreys is also president of the Bessemer Coke Company, while Herman Griffin is treasurer of that concern. The Bessemer Coke Company have let contracts for the erection of 100 additional ovens at their Griffin Works, to be completed about July 1, giving them practically 300 ovens at that works on that date, 200 of which will belong to the Bessemer Coke Company and 100 to the Columbia Coke Company, all adjoining each other.

The quality of the coke made in the Klondike district is so superior that these additions have been made necessary to meet the growing demand which the Bessemer Coke Company have had for this grade of coke. The further development of this field has proved their coal to be of most superior quality, making coke that runs with but the slightest variations, being practically uniform all the time. It analyzes about 89.31 per cent. fixed carbon, 10 per cent. ash, 0.65 per cent. sulphur, and 0.008 per cent. phosphorus.

### Jones & Laughlins, Limited, Buy Ore Properties.

(By Telegraph.)

PITTSBURGH, PA., April 24, 1901.—Jones & Laughlins, Limited, of the American Iron & Steel Works and Elliza furnaces, at Pittsburgh, have recently closed with Peter L. Kimberly of Sharon, Pa., for the purchase of several large bodies of high grade Mesaba ore, which, with their present holdings, will give Jones & Laughlins a sufficient supply of ore to meet their entire requirements for many years to come. The properties purchased consist of the Humphreys, Columbia, Baker, State lease, Wyoming and Lincoln mines. Only one of these properties has been opened up, and a considerable quantity of ore will be taken from it this year. The rest of the mines will be developed as fast as possible. The price paid for these properties was about \$2,000,000.

Jones & Laughlins, Limited, have completed the building of three large Elliza furnaces at Pittsburgh, and are now at work on the fourth. These four furnaces, together with Soho, which they also own, will give them a total daily output of metal of about 2700 tons, and make their ore requirements very much larger than they have been. The purchase of these ore properties was made to give them enough ore and make them independent of the ore market. The three Elliza furnaces are making good records, each averaging over 500 tons of metal per day, while once in a while a furnace has made up to 700 tons a day.

**American Bridge Appointments.**—PITTSBURGH, PA., April 24, 1901.—(By Telegraph.)—A. L. Schultz, general manager of the works in the Pittsburgh district of the American Bridge Company, has made the following appointments: C. L. McKenzie, manager of the Shiffler Works; Otto G. Schultz, manager of the Keystone Works; T. G. Spielman, manager of the Pittsburgh Works, and John Hayes, manager of the Schultz, at McKee's Rocks. All these plants are in Pittsburgh. Jesse W. Walker, formerly manager of the Walker Works at West Homestead, also owned by the American Bridge Company, has resigned and has severed all connection with that concern. It is probable Mr. Walker will connect himself in a short time with a new bridge building concern.

### PERSONAL.

William Garrett of the Garrett-Cromwell Engineering Company, Cleveland, has sailed for Europe.

A. B. Wolvin has been appointed manager of the fleet of the United States Steel Corporation, with headquarters in Cleveland, Ohio, and L. Coulby of the firm of Pickands, Mather & Co. will act as assistant manager. Mr. Wolvin is the president of the Lake Carriers' Association and one of the most prominent shipping men of that region.

G. G. Thorp, superintendent of the Illinois Steel Company, at Joliet, Ill., has tendered his resignation to take effect May 1. Mr. Thorp will become general superintendent of the Crucible Steel Company of America.

Judge A. A. Phlegar, the new receiver of the Virginia Iron, Coal & Coke Company, has appointed J. L. Brass general manager of the company. Mr. Brass now holds a similar position with the Virginia & Southwestern Railway.

N. L. Frothingham has re-established an office at New York for the practice of patent law and has associated with him F. T. Wentworth.

Alexander Agassiz of Cambridge, Mass., has been elected president of the National Academy of Science, succeeding Dr. Wolcott Gibbs of New York, resigned.

Jacob S. Coxey has engaged D. L. Glenn, formerly assistant master mechanic at the Homestead Steel Works, to be master mechanic of the new steel plant he is erecting at Mount Vernon, Ohio.

J. A. Moore of Millerton, N. Y., has been elected president and treasurer of the Salisbury Carbonate Iron Company, operating the Chatham Furnace. Mr. Moore succeeds the late James Morehouse, with whom he was associated at the Copake Iron Works for many years.

W. Lucien Scaife has been appointed on the Committee of Plan and Scope of the new school of technology at Pittsburgh, in place of C. M. Schwab, resigned.

W. E. Corey has been made treasurer of Carnegie Institute at Pittsburgh in place of C. M. Schwab, resigned.

Jno. H. Smith, formerly superintendent of the rail department of the Ohio works of the National Steel Company, at Youngstown, has resigned and has been succeeded by Fred. Bennett of the Sparrow's Point works of the Maryland Steel Company.

George Westinghouse, Jr., of the Westinghouse interests, at Pittsburgh, sailed for Europe on Wednesday, April 24.

A. C. Dinkey has been made general superintendent of the Homestead Steel Works, the Carrie blast furnaces and Howard Axle Works of the Carnegie Steel Company to succeed W. E. Corey, recently elected president of the Carnegie Steel Company.

Wm. T. Jones, assistant to Thomas James, master mechanic at the Edgar Thomson Steel Works of the Carnegie Steel Company, at Bessemer, has resigned, to take effect May 1. He has accepted the position of master mechanic of the new steel plant of the Dominion Iron & Steel Company, at Sydney, N. S.

C. M. Schwab, president of the United States Steel Corporation, will pay the cost of erection of a large building for the Mt. Aloysius Academy, at Cresson, Pa., which will cost about \$30,000. Alden & Harlow of Pittsburgh are the architects.

Charles S. Guthrie has resigned the presidency of the American Steel Hoop Company, to take effect as soon as his successor, Veryl Preston, is elected. Mr. Guthrie will retire from active business. He has taken a house at New London, Conn. Mr. Guthrie was for many years with Naylor & Co. of New York and Pittsburgh and organized the American Steel Hoop Company.

Andrew Lamberton of Coatbridge, England, one of the leading builders of heavy steel works machinery, has just arrived.

The Cambria Steel Company, Johnstown, Pa., C. S. Price, general manager, advise us that their new open hearth works at Franklin are not yet in operation, daily press reports to the contrary.



# HARDWARE.

**N**OTEWORTHY prosperity is evidently being enjoyed by the jobbing trade, especially in the West. Scattered items have been published in our columns during the last year which show more enlargement of established jobbing houses and more new firms engaging in that branch of business than for many years. It is difficult to find a Western jobbing house which has not added to its facilities for handling trade, or is not contemplating taking such a step in the near future. This is not only due to the greatly increased volume of business now being enjoyed in all sections of the West owing to the existing general prosperity, but is also to be attributed to the recognition of jobbing interests which has been made by the great consolidations and by pools and combinations generally. The line between purchasers in the jobbing trade and retail buyers has been more clearly defined, and the wholesale trade is benefited accordingly. The time may again come when manufacturers will more generally seek business from the retail trade, but of late the tendency has been in the other direction, so far at least as goods are concerned the price of which is regulated by combinations.

The project for a floating exhibition by which American products will be carried to foreign shores and thus brought to the attention of buyers in other countries is striking and picturesque. The suggestion and the manner in which it has been received indicate the interest with which anything relating to the extension of our trade abroad is regarded, and also the characteristic American disposition to adopt new methods in the marketing as well as in the manufacture of goods. While the suggestion of such floating exhibition will be novel to many, the idea is not absolutely new, the plan having been tried in Germany about two years ago with what are claimed to be very satisfactory results. It is said that sales were effected by the exhibition to the amount of more than \$5,000,000 at an expense of about \$100,000. If the project were taken up in this country and put on a basis that would command the confidence and respect of manufacturers and exporters it would certainly be an aggressive movement which would attract much attention from our European competitors, as another illustration of the disposition of American producers to find markets far and near throughout the world. While difficulties will suggest themselves, some of which are of weight, the plan meets with approval from many who deem it practicable. It is thus far only a general suggestion, but it may be before long it will be put in definite form and those interested be given an opportunity to judge of its merit and the prospect for its successful adoption. The expense entailed would necessarily be large to those whose goods were thus carried to the doors of foreign buyers, but the trade are learning more and more that in these times of abundant money and enlarging enterprise this is a matter that does not stand in the way of any project that will result ultimately in securing business and establishing broader trade relations.

## Condition of Trade.

With the progress of the season and the liberal purchasing of the jobbers and retailers there is in many lines a slight relaxing of the demand upon the manufac-

turers. This occasions, however, no uneasiness, as in most cases their order books are well filled and the difficulty of getting out goods promptly is one of the features of the situation. There is, however, less booking of new business, and manufacturers are looking forward to the opportunity of replenishing stocks. The difficulty of getting material promptly is the cause of some delay in the execution of orders. It is in heavy goods that most complaint is heard of delayed shipments, most lines of Shelf and miscellaneous Hardware being supplied with a good degree of promptness. The tone of the market remains strong and confident. Some advances are being made from time to time, with a few minor changes in the direction of lower prices. Export business continues in good volume. It feels to some extent the effect of higher prices here as compared with those current abroad, and some trade has been diverted on this account.

### Chicago.

(By Telegraph.)

The volume of business is possibly not quite so large as during the first half of the month. Nevertheless all sections of the Northwest are buying Hardware quite freely, owing to the great activity everywhere in erecting new buildings and making improvements. Something like seasonable weather is now needed for trade in spring and summer goods. The prolonged cold and frequently inclement weather is interfering with the sale of seasonable goods which dealers have in stock. A few days of sunshine will make a material difference in this respect, and will undoubtedly heavily increase the demand on jobbers and manufacturers. All orders now being received are for very quick shipment. Buyers are urgent, claiming that their stocks are short and that the goods must be received at once. Scarcity in staple lines is still a striking feature of the situation. Jobbers and retailers are being put to great inconvenience by the inability of manufacturers to keep the trade properly supplied. No apprehension is felt about prices as long as goods are so hard to get. This is causing continued good business in the placing of orders for delivery far into the future. The Heavy Hardware trade is extremely active. Jobbers in this line are also greatly inconvenienced by the backwardness of mills in making shipments.

### St. Louis.

(By Telegraph.)

The volume of business in Hardware continues to show a marked increase as compared with last year's trade during the same period. The strictly seasonable goods are, of course, in the most demand, but it is considered remarkable that the demand for staple articles should be so heavy and constant. Straps, Butts, Hinges and the cheaper grades of Builders' Hardware are in great demand. Refrigerators and Ice Cream Freezers are being shipped extensively. The principal concern is still in the matter of receiving goods from makers with desired promptness. Heavy Hardware jobbers report a great scarcity in Springs and Axles. The demand is so strong that stocks are much broken. The entire line of Vehicle Makers' Supplies is much wanted, and the supply is rather unsatisfactory.

## NOTES ON PRICES.

**Wire Nails.**—Demands upon manufacturers of Wire Nails continue in large volume. Jobbers are unable to get shipments promptly enough for their requirements. Quotations continue as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots.....	\$2.30
To jobbers in less than carload lots.....	2.35
To retailers in carload lots.....	2.40
To retailers in less than carload lots.....	2.50

**New York.**—Local conditions of the Wire Nail market continue unchanged, distribution being about in former volume. Quotations are as follows:

To retailers, carloads on dock.....\$2.53  
Small lots at store..... 2.60

**Chicago, by Telegraph.**—Apparently this spring's heavy trade in Wire Nails is to have no end. The high of the season should be over by this time, but the strong demand keeps up, the pressure for deliveries being as urgent as at any time. Jobbers report a very heavy demand from their customers. Carload lots are held at \$2.45 and small lots at \$2.55, with an occasional concession to \$2.50 to the best traders.

**St. Louis, by Telegraph.**—No falling off is reported in the demand for Wire Nails. None is expected, and meanwhile dealers are anxiously awaiting needed stock to complete assortments. The price to retailers in carload lots is \$2.50, base, smaller lots being quoted at \$2.55, base.

**Pittsburgh.**—The large demand for Wire Nails, which has characterized the market for some time, shows no abatement, but, in fact, seems to be getting larger. The enormous building operations going on all over the country would indicate that consumption of Wire Nails this year will probably be larger than ever before. Most of the orders placed by jobbers, and the small trade as well, are for prompt shipment, indicating that stocks are low. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots.....\$2.30  
To jobbers in less than carload lots..... 2.35  
To retailers in carload lots..... 2.40  
To retailers in less than carload lots..... 2.50

**Cut Nails.**—The volume of Cut Nails being sold is fair, at unchanged prices. It is understood that but a limited quantity of Cut Nails is ordered in less than carload lots from mill. Jobbers buying in carloads are able to make favorable prices on such quantities from stock, making it advantageous to order from them. The difference of 15 cents between the price to jobbers and retailers in less than carload lots is referred to as being more nominal than real. Manufacturers' quotations are as follows, f.o.b. Pittsburgh, plus the actual freight to point of destination; terms 60 days, or 2 per cent. off in 10 days:

Carload lots.....\$2.00  
To jobbers in less than carload lots..... 2.05  
To retailers in less than carload lots..... 2.20

**New York.**—About the usual proportion of Cut Nails are being ordered by the local trade. New York quotations for carload and less than carload lots are based on the above prices, to which Pittsburgh freight has been added:

Carload lots on dock.....\$2.13  
To jobbers in less than carload lots on dock..... 2.18  
From store..... 2.25

**Chicago, by Telegraph.**—Trade in Cut Nails is in excellent condition, the demand keeping up to the record of the past few months, with possibly a slight gain rather than a shrinkage. Small lots from stock are unchanged at \$2.35.

**St. Louis, by Telegraph.**—The demand for Cut Nails is up to the average, with no change in price. Jobbers' price for small lots is \$2.35 to \$2.45, base.

**Pittsburgh.**—There is a fair demand for Cut Nails, with no change in prices. To jobbers, prices are on carload lots \$2, and on less quantities \$2.05, f.o.b. Pittsburgh, plus the actual freight rates. To small dealers and consumers, \$2.20 rates, f.o.b. Pittsburgh, plus the actual current rate; terms 60 days, less 2 per cent. for cash in 10 days.

**Barb Wire.**—Manufacturers are reported as being about four weeks behind orders on Barb Wire, although the mills have been running to their full capacity. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots, Painted.....\$2.60  
To jobbers in carload lots, Galvanized..... 2.90  
To jobbers in less than carload lots, Painted..... 2.65

To jobbers in less than carload lots, Galvanized.... 2.95  
To retailers in carload lots, Painted..... 2.70  
To retailers in carload lots, Galvanized..... 3.00  
To retailers in less than carload lots, Painted..... 2.80  
To retailers in less than carload lots, Galvanized... 3.10

**Chicago, by Telegraph.**—Manufacturers are still far behind on deliveries of Barb Wire and local jobbers are having much difficulty in keeping their customers supplied. Carload buyers have visited the city the past week, interviewing jobbers in the hope of being able to secure desired stock, but without avail. The Barb Wire trade has been enormous this spring. Carload lots are held at \$2.75 for Painted and \$3.05 for Galvanized. Less than carloads are quoted at \$2.85 and \$3.15, respectively, with shading of 5 cents to best buyers.

**St. Louis, by Telegraph.**—Orders are coming in heavily for Barb Wire, and so far no indication is to be seen as to any diminished demand. Carloads to retailers are at \$2.80 for Painted; smaller lots, \$2.85; 30 cents advance is asked for Galvanized.

**Pittsburgh.**—There is a continued heavy volume of business in Barb Wire and much of the demand is for prompt shipment, showing that stocks everywhere are low. Mills are far behind orders and seem to be unable to turn out Wire fast enough to keep pace with the demand. For domestic trade we quote: Galvanized Barb Wire, \$2.90, in carload lots to jobbers, and Painted, \$2.60. Terms, 60 days net, 2 per cent. discount for cash in 10 days, f.o.b. Pittsburgh.

**Plain Wire.**—While the demand for Plain Wire is not as great as for Barb Wire, yet manufacturers are behind on their orders. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. off for cash in 10 days:

	Base sizes.	
	Plain.	Galv.
To jobbers in carload lots.....	\$2.25	\$2.65
To jobbers in less than carload lots.....	2.30	2.70
To retailers in carload lots.....	2.35	2.75
To retailers in less than carload lots.....	2.45	2.85

The above prices are for the base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances.

#### Plain Fence Wire Advances (Catch Weights).

No.	Base	Galvanized.
6 to 9.....	Base.....	\$0.40 extra.
10.....	\$0.05 advance over base.....	.40 "
11.....	.10 " " " ".....	.40 "
12 and 12½.....	.15 " " " ".....	.40 "
13.....	.25 " " " ".....	.40 "
14.....	.35 " " " ".....	.40 "
15.....	.45 " " " ".....	.75 "
16.....	.55 " " " ".....	.75 "
17.....	.70 " " " ".....	1.00 "
18.....	.85 " " " ".....	1.00 "

For even weight bundles, 50 pounds or over, 5 cents per bundle advance on above.

**Chicago, by Telegraph.**—The volume of business in Plain Wire keeps up to the great proportions of the past few weeks, and no indication is seen of a falling off. The mills are much behind on deliveries and jobbers are unable to accumulate any stock. Carload lots are still held at \$2.40, base, and small lots from stock at \$2.50, with an occasional shade to \$2.45.

**Pittsburgh.**—There is a continued heavy demand for Plain Wire, which promises to last for a long time. The volume of business is probably heavier at this time than ever before in the history of the Wire trade. For domestic trade we quote:

	Plain.
To jobbers in carload lots.....	\$2.25
To jobbers in less than carload lots.....	2.30
To retailers in carload lots.....	2.35
To retailers in less than carload lots.....	2.45

Galvanized Wire up to No. 14 is 40 cents advance on Plain; Nos. 15 and 16, 75 cents advance, and Nos. 17 and 18, \$1 advance. Terms are 60 days net, with 2 per cent. off for cash in 10 days, f.o.b. Pittsburgh.

**Augers and Bits.**—The market for Augers and Bits is in good condition, and manufacturers are referred to as maintaining prices quite regularly. The open quota-



tion to the smaller trade is 70 per cent. discount, beyond which concessions are often made by jobbers who have stocks on hand purchased at lower prices than are now current.

**Rivets.**—In view of the price of the raw material and the large volume of business, Rivets are held quite regularly, and the market is characterized by a decidedly firmer tone.

**Carriage Springs.**—There has of late been a heavy demand for Wagon and Carriage Springs, and without any concerted action on the part of manufacturers quotations are higher. The market is represented by the quotation of 5 to 5½ cents for Black or Half Bright, an additional ¼ cent being added for Bright.

**Toe Calks.**—The American Steel & Wire Company and other manufacturers of Toe Calks have advanced the price of Toe Calks ¼ cent per pound.

**Glass.**—It appears that the time for closing the Glass factories of the American Window Glass Company has been definitely settled, and that May 11 is the date decided upon. Arrangements have been made for holding the annual wage conferences during the present month to settle the scale of wages for all Glass workers during the fire of 1901-1902. It is understood that through the wage arrangement or by some other plan, pressure will be brought to bear to induce all Window Glass factories outside of the combine to close down on May 11. The Glass strike in Belgium continues, so that the importation of foreign Glass cannot be counted on to relieve the situation in this country. Jobbers' Association prices are as follows:

	Discount.
Less than carloads.....	85 %
Carloads .....	85 and 10 and 2½ %

**Paints and Colors.**—*Leads.*—The unpleasant weather, at least throughout the East, and the backwardness of the season have affected the demand for White Lead in Oil unfavorably. No change has been made in prices, though few grinders are supposed to have cheap Linseed Oil. Quotations are as follows: In lots of 500 pounds and over, 6½ cents per pound; in lots of less than 500 pounds, 7 cents per pound.

**Oils.**—*Linseed Oil.*—There is something of an improvement in the demand for Linseed Oil in small lots, and a little more of a movement in carloads. Large buyers, however, are buying for immediate requirements and appear to have little confidence in the stability of the market. Crushers are firm in their position as to prices and are holding at 59 to 60 cents in carloads. City Raw is quoted from 61 to 62 cents per gallon, according to quantity. State and Western brands are quoted, according to quantity, from 59 to 60 cents per gallon. Boiled Oil is 2 cents per gallon advance on Raw.

**Spirits Turpentine.**—The local Turpentine market is strong on account of small stocks and a limited quantity to arrive soon. The demand is confined to small orders, as large consumers do not find present prices attractive. Quotations, according to quantity, are as follows: Southern, 35½ to 36 cents per gallon; machine made barrels, 36 to 36½ cents per gallon.

Chas. Johnson, dealer in Hardware, Stoves, Furnaces, &c., Peoria, Ill., has incorporated his business under the style of Chas. Johnson Hardware Company, with a capital stock of \$20,000. The officers of the corporation are: Chas. Johnson, president; Peter Johnson, vice-president; John F. Tjarks, secretary, and William Johnson, treasurer. Peter and William Johnson have been identified with the firm for the past ten years. Mr. Tjarks is also a former employee.

Nicola Hardware & Furniture Company, Washington, Iowa, have been incorporated with an authorized capital stock of \$10,000, of which \$7,000 has been paid in.

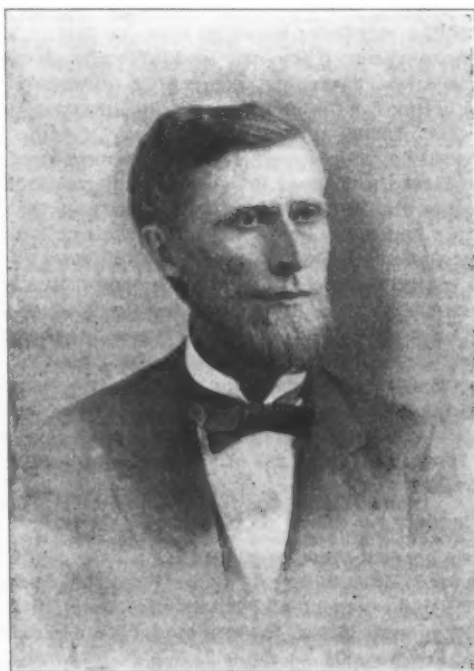
Edson Taber has bought out the interest of his partner, Z. W. J. Newcomb, Hilton, N. Y., in the Hardware, Stove, Furnace and hot water heating business, and will continue under his own name.

## DEATH OF JOHN D. SEEBERGER.

**J**OHAN D. SEEBERGER of the well-known Hardware house of that name died of pneumonia at his home in Des Moines, Iowa, April 19, after an illness of a week. Mr. Seeberger was first taken sick about a month ago, when he suffered from a severe cold, although the trouble was not considered serious until a week before his death, when pneumonia developed.

Mr. Seeberger had been in the Hardware business in Des Moines since 1865 and was one of the best known merchants in the city, and held in the highest esteem by all with whom he came in contact.

J. D. Seeberger was born in the city of New York, November 4, 1836. His parents, natives of Prussia, came to New York in 1834, and in 1839 removed to Wooster, Ohio. The subject of this sketch attended the public schools of Wooster until he was 14 years old, when he entered the dry goods house of J. B. & N. Power of that town. His energy and fidelity won him the confidence and regard of his employers, by whom he was speedily promoted. In 1860, after ten years of continuous service with the firm, he found his health seriously impaired,



JOHN D. SEEBERGER.

which resulted in his spending four years in the territory of Idaho, then a wilderness, from which he returned with renewed health and vigor.

After a few months spent in Chicago he went to Des Moines in February, 1865, when he purchased an interest in the Hardware firm of Childs & Howell. The new firm of Howell & Seeberger continued in the retail Hardware business until 1870, when a jobbing department was added. In 1872 Mr. Seeberger purchased his partner's interest, continuing the business under his own name until his death.

In 1870 about \$50,000 worth of business was done during the year, which has since increased many fold.

Mr. Seeberger is thus referred to by one of his associates: "In the death of J. D. Seeberger, Des Moines loses one of its most conspicuous citizens. As a business man he stood at the head, commanding the respect and confidence of all who came in contact with him. In both business and social life he was the soul of honor and generous to a fault. He responded promptly and liberally to public and patriotic objects, and for religious and charitable purposes gave with liberality and wholeheartedness."

Mr. Seeberger leaves a widow, but no children. A. F. Seeberger of Chicago, formerly in the Hardware business, but late United States Collector of the Port of Chicago, was his brother.

## WORK OF RETAIL HARDWARE ORGANIZATIONS.

**I**N a recent interview Thomas McCracken, secretary of the Minnesota Hardware Association, refers to the importance of the work of retail Hardware organizations and the lines on which the merchants thus associated can make themselves influential in protecting their interests. From his forcible presentation of the matter we make the following extracts:

The issues involved in future association work are ever broadening, and are far more comprehensive than can be successfully met single handed, and we cannot ignore the fact that questions are continually arising in the settlement of which the consensus of opinion of the largest number of wide awake and thoroughly progressive and earnest workers in the different State organizations must be obtained and voiced through the action of a strong executive committee of the National Association.

### EXECUTIVE COMMITTEE WORK.

And right here we believe the executive committees of State associations do not and have not availed themselves of the privileges accorded them or the duties imposed upon them. They are, and of right should be, the association, governing, controlling, directing, guiding and acting for the association on all matters coming before them during the year.

It should be made imperative upon them to meet regularly, at least three times between annual meetings, and associations should remember in electing them that they are in duty and honor bound to sustain their action when in convention assembled.

How many of our State executive committees are at the present time so in touch with the needs of effective association work? Not one, and is it possible that as an organized whole we can afford to permit another year to pass carelessly by, dormant and inactive, until another annual meeting? We hope not. What are we doing looking to the assistance of our retail dealers as against the baleful influence of the catalogue and supply house trade?

### SUPPLY OF GOODS TO CATALOGUE HOUSES.

Can we prevent them from securing all the goods they can pay for? Most assuredly not. Is not this one question worthy the earnest and immediate consideration of every State association in the land? We think so. Have we any remedy to apply? We believe we have, but along different lines than we have heretofore followed.

### CO-OPERATION OF THE JOBBERS.

State jobbers and manufacturers within the States having associations already formed are, as a whole, loyal to us, and upon these several organizations we can surely rely to have them exert an untold influence by keeping in line with association work. We have in the National Hardware Association a mighty factor, and one whose influence cannot and will not be ignored by manufacturers. Do our State associations appreciate the far reaching benefits we derive from their co-operation with us? We fear not.

Very few Eastern manufacturers seek the retail dealers' trade in the West and therefore entirely ignore our associations. They do, however, seek the jobbing trade, and must of necessity have their patronage. Now it appears to us, if we commence upon manufacturers in the East—at the other end of the line—and work toward the West, we will be successful. No effort in this direction, in so far as we are aware, has ever been made, except by the National Retail Association, and State organizations have not given the latter the cordial recognition it should have received.

### WOULD EXERT POWERFUL INFLUENCE.

We can say to these manufacturers, who seem to think they cannot live without selling this trade, go ahead and sell them, but remember, the National Wholesale Dealers' Association, the National Retail Dealers' Association and every State retail Hardware association

say to you, if you permit your line of goods to be advertised and quoted at ruinously cut prices, or, in other words, if you do not, when such sales are made, absolutely protect the jobber and the retailer from such illegitimate competition, they will not handle your wares. How many manufacturers, think you, would reject this reasonable and businesslike proposition, and how long would they continue to sell this objectionable trade?

### THE HARDWARE BROKER.

Another very important question concerning alike the retailer, the jobber and manufacturer is what disposition to make of the Hardware broker, who ordinarily carries no stock of goods, hath no abiding place, carries no samples, but represents as many manufacturers as he can conveniently carry catalogues for, and is agent direct for as many lines as he can obtain, or as many names of different manufacturers as will esthetically appear upon his business card. Cannot we in justice claim from manufacturers that the same restriction be applied to the broker?

### THE OPPORTUNITY.

Our associations are in position to so shape their future action along conservative lines that much of the antagonism heretofore existing against them will give way to co-operative labor in their behalf, and if we do not, as a whole, avail ourselves of this golden opportunity now presented we deserve to suffer therefor later on. Our hope lies in associated organization, and we must not lose sight of this cardinal requirement, however strong we may be as individual State associations.

We trust that State secretaries will see to it at once that their executive committees be advised upon all matters requiring their attention. Let us all put our shoulder to the wheel to maintain what we have gained, and gain, in so far as possible, what we maintain, that the year 1901 may be memorable in the advancement of association work throughout the land.

## STANDARD PAINT COMPANY.

**N**OT long since it was stated in these columns that the Standard Paint Company, New York, manufacturers of the well-known P. & B. Ruberoid Roofing, Preservative Paints, Insulating Papers and Electrical Insulation, had been obliged by the great increase in their business to not only make large additions to their factory buildings at Bound Brook, N. J., but to devote their old New York headquarters in John street entirely to stock and shipping purposes, and secure additional offices at 100 William street, wherein to care for the rapidly increasing volume of business. We now learn that the company have been again obliged to enlarge their plant. Another addition has been made to the Bound Brook works, materially increasing the capacity. For months the plant has been running to its fullest extent day and night, 20 hours out of 24, and two relays of men have been constantly kept working in an effort to keep up with orders.

Edwards & Walker Company, wholesale Hardware, &c., Portland, Maine, expect to occupy about June 1 their new quarters in the United States Hotel Building, Monument Square, opposite their present location. The building is being thoroughly remodeled and arranged to accommodate their large and increasing business. The property fronts on three streets, making it well lighted and convenient for shipping. It is about 125 x 150 feet, five stories and basement.

Joseph B. Ganter & Co. have succeeded Joseph B. Ganter, Reading, Pa., wholesale and retail Shelf Hardware, House Furnishing Goods, Stoves, Furnaces, &c. The firm now occupy four floors, having increased their floor space from 3200 to 6400 square feet. They have also erected a fine two-story brick stable, 20 x 45 feet, for the accommodation of their horses, wagons, &c.

Edward M. Lee has purchased the Hardware stock which Geo. Countryman recently bought from Samuel Keiser, New London, Iowa.



# Notes on Foreign Trade

## BRITISH LETTER.

Office of The Iron Age, HASTINGS HOUSE, STRAND, LONDON, W. C.

### Present Condition of Trade.

THE British Hardware trade is at present severely handicapped by a want of confidence in the immediate future. Purchases are from hand to mouth, buyers being convinced that prices must come down. Indents from China have temporarily ceased, but orders are again coming in from South Africa. New South Wales and New Zealand are buying heavily, as are Mexico and Canada. There is a strengthening of the market for Tools, Guns and Sanitary Appliances. In the brass trades things are dull, Stamped Goods and machine made Brass Ware being in greater request than hand made goods. The copper manufacturing industry is waiting to test the truth of rumors concerning a copper trust.

EDGE TOOL MAKERS BUSY.—Edge Tool manufacturers are busy, principally on account of shipping orders from India and South America. A new market is slowly opening up in West Africa, but European orders are small, both in number and extent. There is a brisk demand for pumping plant and also for Electrical Goods. Stamped Hollow Ware makers are busy, and good Locks are selling easily. This is true also of domestic Galvanized Wares.

MACHINE CUT FILES.—In Sheffield the File trade is kept exceptionally busy, principally for Government departments. A File of heavy weight and very rough is being made for the Royal Engineers in South Africa, and several American and German File cutting machines have recently been installed. The old prejudice against the machine cut File is almost dead. There are now very few factories in Sheffield where machine made Files are not freely used. Altogether trade is quiet, but a hopeful feeling prevails. Much depends upon the expected fall in the price of fuel.

### A Quarter's Foreign Trade.

In my letter published March 21 I drew attention to the decline in British exports of Hardware and metal goods. The Board of Trade returns, ending March 31, lend point and color to my remarks. More, for while these returns indicate a loss on our export trade there is an increase in our imports of such articles as Cutlery, Electrical Goods and Apparatus and Hardware. It is useless speculating on a three months' turn over, but the deduction from it is quite in accord with the prevailing opinion that British Hardware manufacturers are not holding their own. If trade at home were good and trade abroad unsatisfactory, then something might be said for the contention that home manufacturers cannot meet home demands. The reverse is, however, the case. The home trade is quite as depressed as is the export business. Yet we are buying foreign made Hardware in larger quantities. Here are some comparative figures:

#### British Imports.

	Three months, 1899.	Three months, 1900.	Three months, 1901.
Brooms and Brushes.. .. .		\$334,000	\$295,000
Cutlery .....		12,000	35,000
Hardware .....		1,064,000	1,170,000
Cycles and parts.....\$445,000		245,000	230,000
Electrical Goods and Apparatus .....		995,000	1,650,000

WHERE THE IMPORTS ORIGINATE.—The increased importation of Electrical Goods and Apparatus, Cutlery and Hardware is no mere flash in the pan, but is progressive and solid. The imported Hardware is in larger proportion than ever distinctively American in origin. The Electrical Apparatus is still mainly German, as is the Cutlery. I have previously remarked that Americans might very well pay some attention to the Cutlery trade.

CYCLES AND MOTOR CARS.—The trade in Cycles and parts is not complete without reference to increasing purchases in this country of Motor Cars and Motor Cycles. This trade is mainly in the hands of France. Paris makers are very sanguine that they will hold it.

The totals of French machines imported into this country in the years 1897, 1898 and 1899 are respectively

\$38,500, \$113,000 and \$182,000. During those years France exported to this country twice as many Motor Cars as any other country. It is worth knowing, too, that France is not neglecting the Cycle trade, her sales to us averaging during the past three years about \$300,000. French traders are very quiet in their methods, but they contrive to do business.

CUTLERY EXPORTS.—On the export side of the balance may be noted an increase in the Cutlery trade, entirely due to war demands in South Africa, the quarterly exports rising from \$57,000 to \$77,000. Otherwise British exports of Cutlery show a decline, particularly to Russia, Germany, Holland, Belgium, France, Spain, West Indies and Canada.

HARDWARE EXPORTS.—The Hardware section has also increased its sales in South Africa, in consequence of canteen requirements, an increase of \$65,000, but this notwithstanding there is a decrease on the quarter's exports of \$35,000. Here again our large customers have restricted their sales—Russia, Norway and Sweden, Germany, Holland, Belgium, France and Canada. The decline in all these countries is exceptionally large but is partially counterbalanced by increased sales to the United States (probably *en route* to Canada), West Indies, Chile, Australia and New Zealand. The value of British Hardware exported during the first quarter of 1899, 1900 and 1901 is \$1,820,000, \$2,000,000 and \$1,850,000. A big decline is reported in Galvanized Sheets, from \$5,200,000, first quarter last year, to \$3,950,000, last quarter.

GALVANIZED SHEETS, TIN PLATE AND WIRE.—The British galvanizing trade is losing in precisely those countries where America and Germany are gaining, notably Spain, Dutch East Indies, Mexico, Chile, Brazil, Argentina, Australia and Canada. Curiously enough the Philippine Islands have largely increased their purchases, from \$25,000 to \$65,000. Loss of trade is also chronicled in Tin Plates, Cast and Wrought Iron Goods. The export of Wire has increased all round.

### The Demand for Electric Goods.

An instance of the growth of the electrical trade is shown in the action of Cheltenham Town Council. They propose to spend \$30,000, in addition to \$550,000 already sunk in capital account. The Borough Electrical Engineer states that in 1896 (the first year the works were in operation) the number of customers for light was 101. Now they number 490. In the first year the units sold were 47,000; last year 300,000. Commencing with two arc lamps, the number has gradually increased to 440. There was a deficit of \$3000 on the first year's working, but there is now a steady profit of about \$30,000. Cheltenham is a residential town only, so it may be surmised how the electrical trades are spreading in our large industrial centers.

### Another Exhibition.

It is proposed to hold an exhibition in Wolverhampton next year. Local industries and craftsmanship are to be the leading motive. As Wolverhampton is in the very heart of the British Hardware trade, American manufacturers should not fail to be represented.

### England's Canadian Trade.

Advices from Canada are to the effect that orders from Toronto and Montreal for Hardware are well above the average. Montreal traders doing business in the Maritime Provinces, while still grumbling at many little things, continue their trade with Liverpool, Manchester and the Midland Hardware exporters. There is a growing feeling, however, that west of Montreal British Hardware is practically doomed. The easy shipping facilities offered by the St. Lawrence River afford hope, however, to British merchants that they can hold their own in Quebec and eastward.

### Brass Workers' Wages.

During the past six months the Midland brass workers have been dissatisfied, as have also the employers.

The men asked for a minimum rate of wage and the regulation of under hand and boy labor. The Board of Trade appointed an arbitrator under the Conciliation act of 1896. American brass founders and Hardware manufacturers will be interested in reading the award and comparing its terms with conditions obtaining in American workshops. The chief features are:

1. That the minimum rate per hour of a workman, on his attaining 21 years of age, shall be 9 cents and the present bonus of 20 per cent.

2. That no deduction be made for motor or light, but that where such charges are now made, present piece work price and day work rates be reduced to an extent equivalent to the charges which cease to be made.

3. Where workmen are desired by their employers to work more than 54 hours in any week, time and a quarter be paid overtime to day workers, and in the case of piece workers that the piece work earning be supplemented by a quarter of what they would be rated per hour if or when working by time.

The men have failed in securing the minimum wage they asked for. Under this award the minimum wage will be roughly \$6 a week, although, of course, the average wage will be nearer \$7. The men have, however, proved successful in their claim to abolish charges for motor and light. It will be noticed that Midland wages rank lower than those paid for the same work in America, so that it is not high wages that may be offered as an excuse when British manufacturers seek to explain successful American competition.

#### Railway Rates and British Hardware.

American Hardware exporters will note with interest that the British railway companies refuse to abate their freightage terms for Midland Hardware. The latest instance is a point blank refusal even to meet a deputation of manufacturers to discuss a possible reduction of rates for small parcels on passenger trains. It is certain that the chief Chambers of Commerce are deeply concerned with the attitude of the British railway authorities toward manufacturers. It is alleged that excessive freightage charges are throttling the inland trade. One or two large firms like Nettlefords (Screws) and Lysaght (Galvanized Goods) have of recent years deliberately moved to the seaboard to avoid those charges.

## HARDWARE IN THE PHILIPPINES.

FROM OUR SPECIAL CORRESPONDENT.

### Sixth Article.

IN this country there are three classes of houses—namely, the stone of the rich, the wood of the middle classes and the nipa shacks of the lower classes. One can hardly find a piece of metal in the latter, not even a Nail, for everything is put together by means of split bamboo and by mortising.

#### House Trimmings.

In the wood houses, however, there is considerable iron work required in the way of large Bolts, which are inserted through the heavy beams. The cornices are of metal, and in some of the best houses metal sills are also used. These are shipped from Spain and other countries in small lots only, and domestic iron workers are often called upon to make the needed articles. The local shops are therefore always seeking for metal with which to fill orders and often fail to find any.

#### Why Profitable Contracts Are Refused.

I have seen flourishing shops refuse profitable contracts on new buildings simply because they were unable to secure the necessary metals with which to work. As to the stone houses, these are constructed from the famous sandstone of the country, and they are made practically fire proof, as the roof is sheet metal. Russia sends vast quantities of corrugated stock here for this purpose, and some of the machinists have set up furnaces and crucibles with which they reduce the nicely made zinc and other sheet metals to a molten mass and then recast it into shapes which are most desired by them for present uses. These

native machinists are used to getting something out of almost nothing, and when it comes to the matter of expense, the work, when done for the rich natives of the islands, is cheerfully paid for. I have seen contracting jobs in metal on house work which would cost less than \$100 in America figured up to \$1000 gold in this country, due to the expense of getting the metal.

#### Vehicles.

There being no railroads to speak of in the Philippines, there are of necessity many vehicles of different patterns for carrying persons about the country. These vehicles are of Spanish design, and the Spanish manufacturers were not very careful about making substantial vehicles, with the result that about every *barrio* in the country has in it one or more shops for the special purpose of repairing vehicles. These workmen are always short of needed supplies of articles with which to make repairs. I have been in a great many of the little shops and have seen part of the force idle, waiting for some material with which to work, with numbers of vehicles in the yard awaiting repair. Often one vehicle is robbed of parts to repair another. I have observed cases in which the cart of a poor man has been deprived of parts to repair the cart of a rich man. Often the needs of war oblige the teamsters of the United States Army to compel the native wheelwrights to break up native carts in order to get the iron with which to repair the escort wagons, ambulances, &c., of the army.

#### Shipbuilding.

There have been great advances in the shipbuilding line in the Philippines during the short period of American occupation, and the long idle shipyards of the Spanish and the Filipinos are once more humming with work. Previously, when ships were nearly completed, ladrones and pirates were in the habit of descending upon the yards and seizing a vessel. Again, the shipbuilders were discouraged by the raids made by the rebel army, which confiscated many of the completed water craft. But these depredations have ceased and it is now safe for the shipbuilders to operate.

#### Profit in Shipbuilding.

There is much money in the shipbuilding occupation of the Philippines, for at present many new ports are being opened, and with the opening of each new port the scope of business increases for the shipping trade and the demand for vessels is very active. But at every yard in the islands the same old story prevails—plenty of wood, hemp, tar, rosin and general supplies for building native craft, but no iron. Iron is wanted for rib work on some of the narrow coasting craft, and iron is used also in steps for masts and for bracing, for these shipyards now employ numbers of American and other foreign machinists who have introduced modern ideas, and the wood pins of the past are superseded by iron Bolts and Screws.

#### Necessities of the Shipyards.

There is a great field here for the disposal of iron to shipyards. There has been a good demand for light and flat bottom ferry boats for river crossings, and numbers of parties have undertaken to build such lines of boats. I saw several in course of erection near Tigbauan, Panay Island. The builders are Americans, natives and Chinese. The only way that the workman can get iron and outfit for the steam power is by buying up some sugar mill which operates by steam. The engine and boiler outfit is removed bodily from the sugar plant to the boat, and after much altering and hard work a craft is made which can navigate the waters as a ferry from shore to shore. But the cost of a steam power outfit of this description is very high. The writer saw one of these boats in course of construction which would cost when finished an additional expense of \$3000 gold, owing to the little engine and boiler which had been bought from a sugar mill owner, and which in the United States would be valued at about \$400 gold.

#### Farming Implements.

Iron for the making of Farming Implements is in great request. The designs for Farming Tools have



been put into the hands of the natives by means of advertising circulars and books from America, and the Filipino farmer is no longer satisfied with the crude implements which have been used for many generations, but wants the modern kinds he has seen in the pictures. You can visit any shop in which iron is worked and find examples of the advancement of the native farmers by plans which they have put into the hands of the workmen, with the money advanced for the making of certain tools and implements. There is great delay in the making of the tools and devices for labor saving, owing to the old story of no iron.

One will see hundreds of partly finished jobs about the shops, all waiting until the iron collectors come in with new batches of rusty, corroded and rotten iron. As soon as some iron is received the entire force of the shop go to work to complete the jobs. The work is kept going until the supply of iron gives out, and then there is idleness until more of the valuable material is provided.

#### Coals to Newcastle.

A very great call for iron exists in the mining regions, which may seem strange when there are iron mines here, but the miners find it more profitable to mine for gold, silver, lead, copper and other ores. The miners want iron for construction of stamp mills, quartz crushing machinery, wheel making for conveyors and kindred apparatus.

With the supplies of iron sent over there should be forges and bellows provided. The forges of the islands are all defective, being home made. The bellows are long, cylindrical wood tubes, with piston and flange, and operated by a boy.

#### EXPORT NOTES.

Trade with the west coast of South America is fairly steady without new development of importance, except the shipments of large contracts of freight cars for the Chilean Government made within the past two months. These shipments, covering several hundred cars, made a good demand for tonnage, of which W. R. Grace & Co. required 1200 to 1500 tons and Flint, Eddy American Trading Company about 5000 tons, the latter company loading three good sized steamers for Chile in 11 days.

River Plate exports are moderately good although there is much room for improvement. Speculation and the decline in the price of wool has resulted in some commercial failures, one of which was for \$3,000,000, while the others were much smaller. As Galvanized Sheets are cheaper in England than in the United States, and even cheaper in Germany, most of the trade in these lines goes to Europe at present, although some Wire is being shipped from this side. Agricultural machinery is beginning to go forward, but larger shipments will be sent in the summer months, which with Binders' Twine are forwarded up to October. Some goods curiously enough originating in the far East, such as fire-crackers and spices, are shipped from here, because of lack of direct communication. A good amount of miscellaneous Hardware is constantly going out.

John T. Paterson, who has been connected with the Flint, Eddy & American Trading Company, 30 Broad street, New York, for some years, is about to sail for South Africa to assume direct charge of their business in that section of the globe. He will have an office and sample room in Durban, Natal, and, assisted by their representative now in that territory, will make periodical visits through the various African cities. It is the company's intention to fully equip the Durban branch with illustrated and descriptive catalogues of such goods as are exported to the South African colonies, among which may be mentioned Hardware in general, building materials, contractors' supplies, wood working and other machinery, house furnishing goods and utensils, stoves, furniture, &c. Literature of this character may be sent marked "South African Department" to the company at the above address.

## Letters from the Trade.

*Our readers are invited to discuss in these columns questions of trade interest connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.*

#### A Retail Merchant's Inquiries in Regard to Obtaining Favorable Prices.

We lay before our readers the following letter from a retail merchant in New York State, who describes the efforts he is making to meet catalogue house competition, but some difficulty is experienced by him in obtaining catalogues and quotations in certain lines. This is especially the case in plumbing goods. We shall be glad to receive suggestions from the trade as to the proper course for him to pursue:

We are keenly alive to the necessity of obtaining lower prices, and, consequently, buying and selling in larger quantities, in order to meet competition of catalogue houses and others. We handle a line of general Hardware, Tinware, Glass, Crockery, Paints and Oils, Stoves and Ranges, Farm Implements, have tin shop attached, and do some plumbing and furnace work. We mean to carry also a line of Sporting Goods. Being the only store of the kind in a small country village, whose railway connections are very poor, we wish to post ourselves as to prices, kinds and qualities of all goods that may be classed in our trade. Our purpose is to be able to quote prices and take orders for anything that a customer may want which we do not have in stock. In this way we hope to prevent orders going to catalogue houses. We carry a large stock for the location and intend to increase it. Correspondence for the purpose of obtaining catalogues and prices is slow and oftentimes unsatisfactory on general lines. In asking for catalogues of Plumbers' Supplies we have met this reply: "We beg to state unless you are a regular master plumber we cannot quote on these articles, as we have an agreement with the Master Plumbers' Association." We do not have men regularly employed this way, but we do plumbing and have in view four or five jobs for full outfit. In order to quote prices and give estimates on various kinds of work it is necessary to have catalogues for this purpose. We have usually bought our goods from small jobbers in the upper part of the State, but this is unsatisfactory oftentimes. We mean to increase our facilities in this line as well as others.

#### Daily Stock Account.

We are in receipt from a prominent house of the following communication and invite information from the trade in regard to the matter, which is of much general interest:

We would like to ask through your columns, if possible, for the best and most correct method of keeping a daily stock account in a wholesale Hardware house. The idea is this: We want to keep a daily stock account with our stockroom in the simplest and most up to date method, so that we can verify the stock any day by taking the stock book and taking any one article in the stock and see if they correspond. In other words, it will have to balance as correctly as a cash account or trial balance in the regular way, without going into an exhaustive system.

#### Trade Souvenirs.

The following letter relates to articles which have been found suitable for use as souvenirs in connection with openings or other special occasions. Our correspondent desires information in regard to what articles are best adapted to this purpose, and will doubtless appreciate suggestions as to the way in which they can be most effectively used:

Will some of your readers kindly inform us through

*The Iron Age* what articles they have found best suited for souvenirs to give away to men and women at openings? We have particularly in mind an opening for next fall. We should also like to know what is the best way to distribute the souvenirs, and from what part of the store; whether names of those receiving the souvenirs were registered, and if any financial results could be traced to this method of attracting trade?

### DEATH OF ELIAS C. ATKINS.

**E**LIAS C. ATKINS, the founder and head of E. C. Atkins & Co., Indianapolis, Ind., manufacturers of Saws, died at his home in that city of heart failure, April 18. He had been confined to his bed for a week with a complication of diseases, and for three years had been failing in health, but up to within a few days of his death, had been able to visit his office occasionally. The month of March he spent in Florida, hoping to regain his health.

Mr. Atkins was born in Bristol, Conn., June 28, 1833, being the youngest of a family of six. His ancestry



ELIAS C. ATKINS.

was English, the family having come to New England in the seventeenth century. He received some education in his native town, and at the age of 12 was apprenticed to the trade of Saw making, under his uncle, in Bristol, the firm being Atkins, Allen & Co., established about 1838.

When 17 years old his progress in the art was such that he was made assistant foreman of the shop, the youth developing remarkable mechanical genius. When 22 years old his energy and ambition caused him to seek a field of his own, and in 1855 he established the first Saw factory in Cleveland, Ohio; but with the lapse of a year he was convinced that the Saw industry could be developed under more favorable conditions in Indiana, and he therefore moved to Indianapolis in 1856.

He began his business career in that city single handed and with little capital in a small corner of a planing mill. A year or two later he moved into the old city foundry, where he was burned out twice, starting again in the location now occupied by the company, covering acres of ground, where from a small beginning the business has grown so that over 700 men are employed, with a weekly pay roll of over \$6000 and a capitalization of

\$600,000, there being branch houses in Memphis, Minneapolis and Atlanta.

Much of the machinery employed in his large plant was the invention of Mr. Atkins, over 100 patents having been granted to him between the years 1880 and 1890.

From time to time Mr. Atkins was interested in other enterprises, one of which was the Hecla Consolidated Mining Company, in their large silver, copper and lead mines. In the 70's he went into the mountains, and for two years lived the rough life of a miner, his health at that time making it advisable for him to live temporarily in a more favorable climate. During this time Mr. Atkins, by his energy and enterprise, rendered valuable service in advancing the interests of the Hecla Company.

He was a director of the Manufacturers' Natural Gas Company at the time of his death and connected with other business ventures.

He was a member of the Commercial, Columbia and Contemporary clubs, the Board of Trade, and Marlon Lodge, F. and A. M. Having been deprived of a college education in his youth, he continued his self instruction through life, being a great and discriminating reader and possessing a large and complete private library. He became a member of the First Baptist Church of Indianapolis in 1856, and has since been prominently identified with educational matters connected with this denomination, contributing freely to church and school enterprises.

When the establishment of the University of Chicago was pending, and John D. Rockefeller offered his first donation of \$100,000 conditional on a like amount being obtained from other sources, Mr. Atkins' contribution of ground worth \$20,000 made the Rockefeller gift available.

A striking feature of his character was the sincere appreciation, love and esteem with which he inspired his employees, an expression of which was the presentation to him by them a year ago of a beautiful solid silver tea and coffee service.

At a meeting of his employees, held on the day of his death in connection with the expression of sympathy to the bereaved family, the following tribute to his memory was adopted:

We, the employees in the shops of E. C. Atkins & Co., having just learned of the death of Elias C. Atkins, for so many years the head of this institution, have come together for the purpose of giving some expression to our feeling of great loss. We well know (most of us from years of experience) that each one of us has lost a sincere personal friend, who was every day proving his personal interest. Although years ago Mr. Atkins had already built up this institution to the point where it would stand as a proud monument to any man, yet at no time was there any detail in the work of the shops in which he lost interest. He was always alert to keep in touch with the work of the shops, quick to appreciate and praise intelligent and faithful service, and daily gave evidence of his affection for the employees in the shops. He was a just man, clear sighted, and self sacrificing, and his life will always be an inspiration to the employees of this institution. With us he needs no other monument than the impression his life leaves upon us.

Similar action was taken at a meeting of Sawmakers' Union No. 1, resolutions being adopted in which expression was given of Mr. Atkins' sterling qualities as a friend and an employer.

Mr. Atkins was a man of fine physique, tall, erect and dignified. He was of a quiet, undemonstrative temperament, with deep religious convictions, steadfast in his integrity and devotedly attached to his many friends, by whom he will be sincerely mourned. He leaves a widow and six children—one son and five daughters.

Stark & Tesch, Appleton, Wis., have dissolved partnership by mutual consent. William Tesch has purchased Mr. Stark's interest and will continue the business at the old stand. Mr. Tesch occupies a store 45 x 100 feet in dimensions, with basement, and carries a general line of Hardware, as well as Agricultural Implements and stoves.



## SHOW WINDOW DISPLAY.

*This Department is to give information in regard to the use which may advantageously be made of show windows of Hardware stores, with practical suggestions in regard to the arrangement and display of goods and other methods of attracting business.*

*The trade are invited to contribute information in regard to methods which have proved satisfactory, with descriptions of attractive displays. Inquiries also are solicited, to which careful attention will be given.*

### FREQUENCY OF CHANGING DISPLAYS.

How frequently should a window display be changed to secure the best returns is a question that the thoughtful Hardware merchant cannot fail to ask.

Correspondence with a large number of representative Hardware merchants in various parts of the country has yielded valuable information on this subject. The general opinion is strongly in favor of frequent changes, the majority advising that the show windows be changed weekly, while over 85 per cent. recommend changes every two weeks or oftener. One correspondent advises that changes be made every day in the year.

The following table summarizes the views of 70 correspondents on this subject:

Daily.....	1
Once or twice in a week.....	3
Weekly.....	37
Every one or two weeks.....	15
Every two weeks.....	4
Monthly.....	6
Every two months.....	1
Quarterly.....	1
Weekly in cities; quarterly in towns.....	1
When windows cease to attract attention...	1

The opinions expressed by many of these correspondents are to the point and of value as showing the results of their experience and observation. We make the following extracts:

#### Something New Every Week.

A progressive merchant in Iowa who devotes much careful attention to his window displays and his newspaper advertising and is a strong believer in weekly changes writes as follows:

A window display to become attractive should be changed at least once a week. People become tired of seeing the same thing or the same collection of articles week after week. The monotony in time produces blindness, and the public "having eyes see not." Something new every week attracts attention, which is the purpose of the window display.

#### At Least Once in Two Weeks.

From a large North Carolina house comes the suggestion of sometimes alternating the display of one line of goods with display of different lines. This thought is worthy of consideration. Our correspondents say:

We should say that window display should be changed not less frequently than once in two weeks. We think it decidedly advisable to change the grouping of articles which are being displayed without changing the line. A line like Heating Stoves can be advantageously kept in a window about half of the time from September 1 to February 1. In displaying such a line, we think it well to let the Stoves stay in the windows about two weeks, then change to something else for a week, then go back for another two weeks to the Stoves, &c.

#### Make Displays in Advance of Season.

A valued correspondent in Colorado in advising frequent changes of displays and pointing out that it is always well to show goods before they are in demand, writes:

We daily note sales coming from each display, so as to keep track of results obtained. It is our custom to change frequently, and with special reference to the season. At this time one of our windows is devoted exclusively to Dairy Goods, Churns, Creamery Cans, Dairy Pans, Butter Bowls, Ladles, Skimmers, &c. These displays should be made rather in advance of the season so as to set the prospective customer thinking. He will then associate your store with his wants when they occur.

#### Changes a Window When He Tires of It.

A merchant in Kentucky, whose windows are prepared with considerable pains and command attention, writes as follows:

"How frequently should window displays be changed?" This, of course, depends entirely upon the season of the year, as well as the character of goods in the display, and the size of the town. In small sized towns some articles should not be changed under 30 days, while other articles should be changed every week. The rule that I usually adopt is my own feeling. When I tire of a certain line of goods in the show window or a certain idea of form of display, I change it. It is impossible to put any set length as to time to allow a display to remain. I have dressed windows that were kept intact 60 days, and at the expiration of 60 days when the windows were dismounted our customers would inquire why the windows were changed, but, of course, these things are special, and cannot be done as a regular thing.

#### Change Displays and Wash Windows Fortnightly.

An Iowa merchant points out the importance of washing windows between each display. He writes, in part, as follows:

It is our best judgment that displays should be changed every two weeks, and the glass cleaned. Window washing is not the most pleasant of tasks, but a very important feature of window trimming. A man cannot use a pair of spectacles that are not clean with any satisfaction, and why should you expect one to be attracted by anything displayed in your windows if the glass is not clean?

#### Very Frequent Changes are Desirable.

The following experience and practice of a wide awake New Jersey house, whose windows are carefully arranged, is of value:

Our windows are divided into four parts, each a little over 5 feet in width, and our practice is to change at least one of these compartments, if not two, each week. The changes depend something on the goods, the elaboration of display, &c. We should say from our experience that very frequent changes are desirable, even if goods are only changed from one window to another.

#### It Pays to Change Once a Week.

A large house in a Southern Connecticut city, who are firm believers in show window advertising, say:

We figure to change our windows once a week, and take as much pains with them as the dry goods people do to make them attract-

ive and to present distinct lines of goods, not a mixed up line. We have proved long ago that this sort of advertising pays, as the people come direct from the window into our store and buy goods.

#### **Advise Changing Every Monday Morning.**

A Minnesota merchant well known for his unique and attractive ways of advertising, in writing of changing window displays, says:

In the smaller towns where window dressers are not employed it is sometimes difficult to find time to make window changes with regularity. A window should not stand with the same display longer than two weeks at the very longest, and a change every Monday morning would be better.

#### **Change Every Week.**

A large Illinois house, whose large show windows are always used to good advantage, and who get up striking displays, write as follows:

We think the show window should be changed every week, as windows should always look fresh and clean in order to be attractive, and then again it is not hard on any class of goods to be left in a window a week, while if left there longer they would look more or less shop worn.

#### **Show Goods Advertised in Weekly Paper.**

An Indiana merchant, whose practice is to trim his windows with the articles advertised in his weekly paper, writes:

We try to show such goods in the window as we have advertised that particular week, and generally change our show windows once a week, except the walls, which are trimmed with Tools, &c., which are not changed as frequently.

#### **Change Some Displays Daily.**

The practice of a Tennessee house, who make very frequent changes in displays, is described by them as follows:

The frequency of changing a display depends very much upon what one has in it. Some of our displays we change twice a week, and some of them every day, but no window should be allowed to stand longer than one week.

#### **Elaborate Displays Deserve Most Publicity.**

A Minnesota firm, who give much attention to advertising in its different branches, in writing about the frequency with which a window display should be changed, say:

An elaborate display deserves more publicity than a simple one. We generally let our window displays stand one week, and during that time we call the attention of the public to our window in our ads.

#### **Generally Changes Displays Weekly.**

A Massachusetts correspondent, advising that weekly changes are best, except in special cases, says:

Window displays should be changed weekly, with the exception of special displays like Fishing Tackle, Guns and Shooting Material, which may be allowed to stand for two weeks to advantage.

#### **Often Changed the Better the Results.**

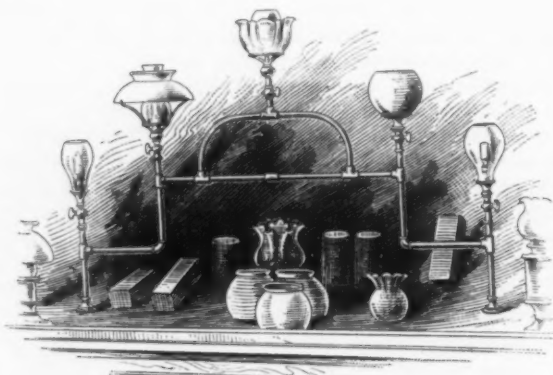
A North Dakota firm, whose experience has taught that frequent changes in window displays pay, write as follows:

Our experience has been that the oftener the windows are trimmed the better the results, and, if it is done each week, we believe there will be no cause for complaint for the time taken.

## **A DISPLAY OF INCANDESCENT GAS LAMPS.**

Incandescent Gas Lamps like the Welsbach and Incandescent Gas Lamp Supplies have been found by many Hardware merchants to be a very profitable and convenient side line to carry. They take but little room in the store and a complete stock requires but a small investment. In most towns and cities where gas is in general use incandescent gas burning supplies have met with a ready sale, especially where they have been pushed by window and indoor display.

A prominent New Jersey dealer, who takes special pains in making his windows sell goods, recently told a representative of *The Iron Age* that he received greater direct returns from his show window when exhibiting



*A Display of Incandescent Gas Lamps.*

Welsbach Burners and Supplies than when used in any other way.

A simple method of showing the burners in operation is in use in the store of B. H. Trowbridge & Son, Poughkeepsie, N. Y. It consists of a fixture of gas pipe, which from the illustration it will be seen can be made in any plumbing shop out of ordinary gas pipe, tees, elbows and cocks, and which is attached to the gas supply. This fixture has been gilded, adding much to its attractiveness for window use. Five Burners with different kinds of shades are put on the fixture. At night this cannot fail to make an attractive exhibit, showing off the other Lamps and Supplies grouped under and around the lighted fixture.

## **BASEMENT SASH WEIGHT BINS.**

**T**HE bins for Sash Weights, shown in the accompanying illustration, are in use by the Jones Hardware Company of Richmond, Ind. The bins are 4 feet deep, open at both ends, and are located in the basement between



*Basement Sash Weight Bins.*

two pillars. Beginning at the left, the top row of bins contains  $\frac{1}{2}$  pound and pound additions, also 2, 3, 24 and 22 pound Weights in order named. The next row holds 4, 5, 15, 16, 18 and 20 pound Weights, while the three



larger bins in lower row are used for 6, 7 and 8 pound Weights. The six smaller bins to the right of the large ones contain 9, 10, 11, 12, 13 and 14 pound Weights. The irregular order in which the sizes are arranged is intentional. The size of Weights is plainly marked above each bin. The bins will hold two carloads of assorted Weights, and are found to be very convenient and satisfactory.

### RULES FOR THE HARDWARE STORE.

**T**HE rules which are given below have been in force for several years in the Hardware store of Chandler & Barber, Boston, Mass., who are well known as enterprising and progressive merchants. They refer to them as well adapted to their business and as used with good results. They are appropriately prefaced by the following reminder to their clerks, which they have issued a couple of times when trade was unusually dull and unsatisfactory:

#### Reminder to Our Clerks.

The condition of trade shows us that we are making no money, and that our expenses are nearly as much as when trade was good and a better margin of profits was to be obtained. This being the case, if we are to continue in business and keep our present force of help, it will be absolutely necessary that each one see to it how much can be gained.

There are different ways of doing this, but some of the most important which will have to be kept in mind are, to remove dead or unsalable stock, and that goods may not be in this condition, sell the worst of any particular kind of goods first.

Bronze goods may be unpapered; use these, adding Screws if necessary, and in this way much of what otherwise would be dead stock will be sold.

Another way is to get as much profit as possible from each sale. Do not discount two or three cents on each sale to make "even money," as you can readily see that if each employee does this on two or three sales a day a considerable sum is lost.

Do not charge goods at dozen prices except when necessary to regular customers, and then in not less than half dozens. See Rule No. 2. In getting the price for each a cent or two can be added to the dozen price.

Another good and more important way is to make a permanent customer out of each one to whom a sale, no matter how small, is made. This can easily be done by politeness and care for the customer's interest, and inquiring as to what may be his possible needs. It should be the ambition of each, not simply to sell the articles called for, but something in addition, not, of course, by any "Jew" method.

Other ways are to be constantly on the lookout against waste or extravagance in the little details of business. Promptness in attending to a customer, in filling orders, and in answering any demand made upon you is more than ever necessary at this time, and you will observe that this is one of the essential qualifications for successful business.

A considerable portion of loss sustained has been through bad accounts. If each salesman will feel a responsibility for his customers, and watch the accounts, he can very often collect them better than any one else. Sharp collections will help out on the profits of the future.

We hope each one will use every effort to excel in these respects, and in others which have not been mentioned. Rules have been changed and we wish each employee to read them until familiar with them.

#### Store Rules.

Take every order on Order Book, or, if not at hand, on Pocket Order Book. First put down complete address, including name of "Job." Carry out numbers and prices. If by written order, enter before filling; mark with initials and place on file. In no case enter on Pass Book or give bill or memo, before charging. Keep Pocket Order Book in store coat pocket and ready for instant use.

Price up charges at time of sale. This must be done

before charges are copied. Extend prices by dozens, if half dozens or more. If less, at so much each. See that prices correspond with quantity—i. e., do not put down gross prices where charged by dozen. When more than one item is sold, either cash or charge, always make memo. as goods are laid out; then compare item with memo.

Have each lot of goods, including Nails and Paper, looked over by one competent. Fill out slips properly and inclose and make note on Order Book of person calling back.

All goods leaving the store must be receipted for or name of person to whom delivered put with entry of goods.

Make no private memo. charges on Pocket Order Book, or anywhere, except in regular order of day's business. If for good reasons it does not need to be entered on Journal, mark "Don't Copy," and carry any such memo. and balance of orders to first working day of each month. Then going backward, scanning each page, mark top "C" when clear. Nothing but balances of orders to be carried over to the following month without being charged.

Make no new accounts until blank is filled out and authorized by one of the firm, and when done so state with charge, with number of application for account. All accounts made in any other manner will be at the risk of salesman who made the sale and who will be expected to settle for same.

All credits of cash must be made in office by book-keeper, cashier, or one of the firm, and credits of merchandise must be examined or rechecked by one of the firm. All goods returned must be entered on the Pocket Order Book slip with name of persons returning the same.

Call back each morning, or when requested to do so, and make a "C" around journal folio when called, or put down folio page.

Examine invoices each morning, and compare prices and quantity with sale. If correct, check and put down initials on invoice.

No new Tool can be taken from stock to be used except by permission of one of the firm or of J. H. Chandler. Those in use about store must be marked and kept in their proper places. Any store Tool loaned must be charged to parties taking them and credited if returned in good order.

Each salesman can have for store use one Rule, No. 36½, which must be marked in the slide with salesman's name.

Pencils hereafter will be kept in the office and given out by the stenographer. No other article can be taken for store use without permission of one of the firm.

#### RULES FOR MANAGEMENT OF STOCK IN INDIVIDUAL SECTIONS.

Each employee shall be responsible for the condition of his section, as by observing care and uniformity the stock can be kept clean, in good order and well fronted up.

All goods received should be properly marked and sampled. Sample box should be marked with section and shelf number and the location of overstock, if any.

All goods must be evenly arranged in order from left to right by number, size or grade. Largest packages should be placed underneath, broken packages on top; nothing put behind except overstock of what is directly in front.

Fill orders from overstock in the back, using broken packages and shop worn goods first.

Unsalable stock must be put in good order to push sales. Memorandums must be taken of shortages in stock and promptly reported.

These instructions are to be faithfully followed.

Kliebenstein & Girard have succeeded Shaw & Kent, Heavy and Shelf Hardware, heating and plumbing, Emmetsburg, Iowa. L. F. Kliebenstein comes from Superior, Iowa, where he was formerly cashier of the Superior Bank. Mr. Girard hails from Dubuque, where he was salesman in a retail Hardware store.

# The Retail Hardware Merchant's Pamphlets, Circulars, &c.

There is large opportunity for retail merchants to use circulars, pamphlets, &c., in cultivating trade. We refer below to some forms of such printed matter which have been used successfully by enterprising merchants. We invite samples of others which have proven themselves trade winners, especially if they contain unusual features of arrangement or subject matter.

## SPRING OPENING CIRCULAR.

The circular, of which a reduced reproduction is herewith shown, was 11 x 17 inches in size. It was used by Byron E. Walter, South Milwaukee, Wis., to announce a "spring opening in Hardware specialties." To raise it in the estimation of those receiving it above the ordinary hand bill it was printed on a good quality of paper. The purpose of the circular is fully stated, being an inducement in the way of prices to further trade. An enumeration of the lines of goods handled gives patrons an excellent idea of the variety of the goods that can be purchased at this store. The names and addresses of the parties to whom the circular was sent were obtained from the ledger index, which furnished a very good list,

### Spring Opening in Hardware Specialties.

TO OUR PATRONS.

In handing you this circular, it is our desire to thank you for your past patronage and trust that the prices herein named will meet with your approval and be an inducement for further trade.



WHAT WE SELL.

Hardware, cutlery, tools, paints, oils, brushes, glass, household goods, lamps, farming and garden tools, refrigerators, ice cream freezers, lawn mowers, gasolines and oil stoves, screen doors and windows, screen wire, wire fencing, stoves, ranges, etc. etc.

<p><b>Good Churns</b>, the celebrated "Barnett", large wooden ones, no. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1010, 1011, 1012, 1013, 1014, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1027, 1028, 1029, 1030, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1038, 1039, 1040, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1050, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 1059, 1060, 1061, 1062, 1063, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1079, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1092, 1093, 1094, 1095, 1096, 1097, 1098, 1099, 1100, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1110, 1111, 1112, 1113, 1114, 1115, 1116, 1117, 1118, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1150, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1170, 1171, 1172, 1173, 1174, 1175, 1176, 1177, 1178, 1179, 1180, 1181, 1182, 1183, 1184, 1185, 1186, 1187, 1188, 1189, 1190, 1191, 1192, 1193, 1194, 1195, 1196, 1197, 1198, 1199, 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1210, 1211, 1212, 1213, 1214, 1215, 1216, 1217, 1218, 1219, 1220, 1221, 1222, 1223, 1224, 1225, 1226, 1227, 1228, 1229, 1230, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1240, 1241, 1242, 1243, 1244, 1245, 1246, 1247, 1248, 1249, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1259, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1270, 1271, 1272, 1273, 1274, 1275, 1276, 1277, 1278, 1279, 1280, 1281, 1282, 1283, 1284, 1285, 1286, 1287, 1288, 1289, 1290, 1291, 1292, 1293, 1294, 1295, 1296, 1297, 1298, 1299, 1300, 1301, 1302, 1303, 1304, 1305, 1306, 1307, 1308, 1309, 1310, 1311, 1312, 1313, 1314, 1315, 1316, 1317, 1318, 1319, 1320, 1321, 1322, 1323, 1324, 1325, 1326, 1327, 1328, 1329, 1330, 1331, 1332, 1333, 1334, 1335, 1336, 1337, 1338, 1339, 1340, 1341, 1342, 1343, 1344, 1345, 1346, 1347, 1348, 1349, 1350, 1351, 1352, 1353, 1354, 1355, 1356, 1357, 1358, 1359, 1360, 1361, 1362, 1363, 1364, 1365, 1366, 1367, 1368, 1369, 1370, 1371, 1372, 1373, 1374, 1375, 1376, 1377, 1378, 1379, 1380, 1381, 1382, 1383, 1384, 1385, 1386, 1387, 1388, 1389, 1390, 1391, 1392, 1393, 1394, 1395, 1396, 1397, 1398, 1399, 1400, 1401, 1402, 1403, 1404, 1405, 1406, 1407, 1408, 1409, 1410, 1411, 1412, 1413, 1414, 1415, 1416, 1417, 1418, 1419, 1420, 1421, 1422, 1423, 1424, 1425, 1426, 1427, 1428, 1429, 1430, 1431, 1432, 1433, 1434, 1435, 1436, 1437, 1438, 1439, 1440, 1441, 1442, 1443, 1444, 1445, 1446, 1447, 1448, 1449, 1450, 1451, 1452, 1453, 1454, 1455, 1456, 1457, 1458, 1459, 1460, 1461, 1462, 1463, 1464, 1465, 1466, 1467, 1468, 1469, 1470, 1471, 1472, 1473, 1474, 1475, 1476, 1477, 1478, 1479, 1480, 1481, 1482, 1483, 1484, 1485, 1486, 1487, 1488, 1489, 1490, 1491, 1492, 1493, 1494, 1495, 1496, 1497, 1498, 1499, 1500, 1501, 1502, 1503, 1504, 1505, 1506, 1507, 1508, 1509, 1510, 1511, 1512, 1513, 1514, 1515, 1516, 1517, 1518, 1519, 1520, 1521, 1522, 1523, 1524, 1525, 1526, 1527, 1528, 1529, 1530, 1531, 1532, 1533, 1534, 1535, 1536, 1537, 1538, 1539, 1540, 1541, 1542, 1543, 1544, 1545, 1546, 1547, 1548, 1549, 1550, 1551, 1552, 1553, 1554, 1555, 1556, 1557, 1558, 1559, 1560, 1561, 1562, 1563, 1564, 1565, 1566, 1567, 1568, 1569, 1570, 1571, 1572, 1573, 1574, 1575, 1576, 1577, 1578, 1579, 1580, 1581, 1582, 1583, 1584, 1585, 1586, 1587, 1588, 1589, 1590, 1591, 1592, 1593, 1594, 1595, 1596, 1597, 1598, 1599, 1600, 1601, 1602, 1603, 1604, 1605, 1606, 1607, 1608, 1609, 1610, 1611, 1612, 1613, 1614, 1615, 1616, 1617, 1618, 1619, 1620, 1621, 1622, 1623, 1624, 1625, 1626, 1627, 1628, 1629, 1630, 1631, 1632, 1633, 1634, 1635, 1636, 1637, 1638, 1639, 1640, 1641, 1642, 1643, 1644, 1645, 1646, 1647, 1648, 1649, 1650, 1651, 1652, 1653, 1654, 1655, 1656, 1657, 1658, 1659, 1660, 1661, 1662, 1663, 1664, 1665, 1666, 1667, 1668, 1669, 1670, 1671, 1672, 1673, 1674, 1675, 1676, 1677, 1678, 1679, 1680, 1681, 1682, 1683, 1684, 1685, 1686, 1687, 1688, 1689, 1690, 1691, 1692, 1693, 1694, 1695, 1696, 1697, 1698, 1699, 1700, 1701, 1702, 1703, 1704, 1705, 1706, 1707, 1708, 1709, 1710, 1711, 1712, 1713, 1714, 1715, 1716, 1717, 1718, 1719, 1720, 1721, 1722, 1723, 1724, 1725, 1726, 1727, 1728, 1729, 1730, 1731, 1732, 1733, 1734, 1735, 1736, 1737, 1738, 1739, 1740, 1741, 1742, 1743, 1744, 1745, 1746, 1747, 1748, 1749, 1750, 1751, 1752, 1753, 1754, 1755, 1756, 1757, 1758, 1759, 1760, 1761, 1762, 1763, 1764, 1765, 1766, 1767, 1768, 1769, 1770, 1771, 1772, 1773, 1774, 1775, 1776, 1777, 1778, 1779, 1780, 1781, 1782, 1783, 1784, 1785, 1786, 1787, 1788, 1789, 1790, 1791, 1792, 1793, 1794, 1795, 1796, 1797, 1798, 1799, 1800, 1801, 1802, 1803, 1804, 1805, 1806, 1807, 1808, 1809, 1810, 1811, 1812, 1813, 1814, 1815, 1816, 1817, 1818, 1819, 1820, 1821, 1822, 1823, 1824, 1825, 1826, 1827, 1828, 1829, 1830, 1831, 1832, 1833, 1834, 1835, 1836, 1837, 1838, 1839, 1840, 1841, 1842, 1843, 1844, 1845, 1846, 1847, 1848, 1849, 1850, 1851, 1852, 1853, 1854, 1855, 1856, 1857, 1858, 1859, 1860, 1861, 1862, 1863, 1864, 1865, 1866, 1867, 1868, 1869, 1870, 1871, 1872, 1873, 1874, 1875, 1876, 1877, 1878, 1879, 1880, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 1890, 1891, 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, 1900, 1901, 1902, 1903, 1904, 1905, 1906, 1907, 1908, 1909, 1910, 1911, 1912, 1913, 1914, 1915, 1916, 1917, 1918, 1919, 1920, 1921, 1922, 1923, 1924, 1925, 1926, 1927, 1928, 1929, 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124</p>
---



The programme, which was printed on yellow paper, is reproduced, reduced in size, in Fig. 2. The invitation and programme were mailed to everybody about the town within a radius of 8 or 9 miles.

During the last festival the crowd was not so large as it was the previous year, owing to the rainy weather which prevailed. There were, however, nearly 1100

tory advertising ever done by the company. Many instances are known where the catalogue has been pro-

**..Programme..**  
**..Second Annual Harvest Festival..**

**C. S. Hughes & Co., Hardware,**  
**Friday and Saturday, September 28th and 29th, 1900**  
**Downers Grove, Illinois.**

This Festival is designed primarily so that the people of Downers Grove and adjacent territory may come and meet old friends and make new acquaintances while taking two days' holiday. We want to be a help to you. The goods we sell and the prices we make will save you money. The store will be beautifully decorated with the garnered fruits of the harvest and everything will be done to give you a good time. Why not come? Of course you'll come.

**Every Lady**  
Examining our display of Stoves and Ranges will be presented with a sample of E-Z Stove Polish.

**Every School Child**  
Will be given Free a Tablet of Paper and a Lead Pencil. Get in line Saturday at 3 o'clock p. m.

**Every Adult**  
Will be given Free a small Pocket Looking Glass—a souvenir from C. S. Hughes & Co.

**Refreshments Served Free.**  
Refreshments of Ice Cream and Cake to eat and Lemonade to drink will be served free to Adults on the second floor from 9:30 a. m. to 9:30 p. m. daily.

We promised last year the two biggest days Downers Grove had ever seen and we kept our promise. It went away beyond our expectations. This year will be bigger yet. Come and see yourself.

**Daily Programme.**

9.30 a. m.—American Steel and Wire Co., display of wire and wire mesh.  
10.00 a. m.—Cooking done on Universal stoves by competent cooks. Cakes, pastries & Col. stores.  
10.30 a. m.—Exhibit of McCormick Harvesting Machine, machinery by expert.  
11.00 a. m.—The Superior-Williams Co. paint exhibit. Paint ready for the brush.  
11.30 a. m.—Exhibit Furman Bros. Farm Wagon, Oil Stoves.  
1.30 p. m.—Exhibit Standard Sewing Machines.  
2.00 p. m.—Exhibit David Bradley piano, etc. by an expert.  
2.30 p. m.—Exhibit Keweenaw Wagon.  
3.00 p. m.—Exhibit Carriages and Buggies—the latest and best line ever displayed in Downers Grove.  
3.30 p. m.—Exhibit Dayton Heating Washing Machines.  
4.00 p. m.—Exhibit Universal Stoves and Ranges. Cooking in operation.  
4.30 p. m.—Exhibit complete line of Cate's Original Hot Blast Stoves.  
5.00 p. m.—Exhibit Blanchard Manufacturing Co.'s goods. Food grinders, hay loaders, corn shellers.  
5.30 p. m.—Exhibit Appliance Manufacturing Co.'s goods. Every farmer his own miller.  
6.00 p. m.—Miscellaneous exhibitions.

**Zenda Orchestra Concerts.**

Programme for Friday Evening, Sept. 28th at 7.30.

Union Power March.....Berber  
Rosa Regatta Overture.....Gardner  
Faintest Wail.....Alford  
The New Century March.....Brooks  
Hope Sublime—March.....Barrett  
Ten Minute Intermission.....  
At Comstock's Picnic.....Linn  
The Merry Minstrel.....Vander  
Maiden's March.....Brooks  
The Forest March.....Fox  
Bill Green's Cakewalk.....Kinsley

Programme for Saturday evening, Sept. 29 at 7.30.

Fortune Teller March.....Berber  
Rosa Regatta Overture.....Gardner  
Union Power March.....Alford  
Heaven My God to Thee.....Brooks  
Ten Minute Intermission.....  
Rosa Regatta Overture.....Barrett  
National Overture.....Schlegel  
Selma Schottische.....Hart  
Amen Del Gueo Waltz.....Halter  
Marching Through Georgia.....Berber

Fig. 2.—The Programme.

visitors, while the sales for the two days were of a gratifying amount, and the festival proved a winner. The store and grounds around the building were decorated, and a strong effort was made to arrange goods so they could be seen to advantage. In carrying out the daily programme, which is shown in Fig. 2, representatives from the principal concerns were present to explain the goods to the visitors and to give practical demonstration.

A RETAIL CATALOGUE.

E. E. Lawrence Company, Hillsdale, Mich., issue an illustrated catalogue and price-list representing a portion of the goods carried by them, for distribution among their customers. On the inside page of the back cover is a list of articles alphabetically arranged, containing over 200 names of Hardware and kindred articles which the company deal in. Only a few were ready for distribution at the time the annual fair was held, but eventually 5000 copies were printed, to be scattered throughout the surrounding country, the aim being to get them into every home within a radius of 10 or 12 miles of the store. The catalogues have been heard from very often, and are regarded as the most satisfac-

C. E. LAWRENCE COMPANY.

**Russell & Erwin Locks and Latches**



We especially call attention to our stock and assortment of Locks, Latches, Bolts, Screws, Copeland Trimmings, Sash and Blind Trimmings, in fact all Hardware for House or Barn. We have a complete line of the Russell & Erwin Manufacturing Company's Goods, who have led in quality price and variety for the past forty-six years. A comparison of their

**Door Trimmings, Etc.,**  
and the very Low Prices at which we sell good goods, will convince you that you want no others. Their

**Strictly Up-to-Date**  
First-Class Trimmings we can and will sell to you at as low or lower prices than others get for inferior goods. Nothing adds more to the appearance and value of a house for the little cost than good, tasty, modern Trimmings.

**We Have Them and believe You Want Them.**  
at our low prices. See them before buying.

Reduced Reproduction of One of the Catalogue Pages.

served in farmers' houses, and in a number of instances the price of articles illustrated in it has been asked. The accompanying illustration is a reduced reproduction of one of the catalogue pages.

ROCHESTER MECHANICS' INSTITUTE.

THE officers and directors of the Mechanics' Institute, Rochester, N. Y., marked the opening of the new Eastman Building of the institute by an exposition and series of entertainments lasting throughout the past week, April 15 to 20. The new building is the gift of George Eastman and represents an outlay of over \$200,000. The proceeds of the week will be devoted to the equipment of the new building in the way of furniture and apparatus. One large group of rooms was devoted to a unique display of goods manufactured in Rochester, which well sustained the industrial reputation of that city. Prominent among the exhibits in one of the larger rooms, appropriately arranged and decorated for the purpose, was that of the Caldwell Mfg. Company. An attractive booth, especially constructed for the purpose, showed off to the best effect their various specialties, including Caldwell's Sash Balances, Empire Door Holders, Gem Nutmeg Graters, Up-to-Date Trouser and Skirt Hangers, the Perfection Automatic Hose Reel, Jumbo Nut Crackers, &c. The Rochester Stamping Company had a large exhibit in pyramid form showing samples of their complete line of high grade Metal Specialties in the form of Table and Kitchen Ware. Wilmot Castle & Co. were in evidence with a comprehensive exhibit of the product of their works, embracing among other articles the Arnold Steam Cooker, Milk Sterilizers and "Pasteurizers," New Era Gas Heaters, Gas Lamps, &c. C. W. Trotter & Sons made an attractive showing with their line of Refrigerators.

Hunter Hardware Company, Rockford, Ill., have bought the Dent Hardware stock. Gilles Hunter, the proprietor of the Hunter business, is an enterprising merchant and is well known locally as an aggressive advertiser.

## REQUESTS FOR CATALOGUES, &c.

*The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.*

**D**YERSBURG HARDWARE COMPANY, Dyersburg, Tenn., dealers in Hardware, Stoves, Wagons, Buggies, Sporting Goods, &c., have added a first-class tin shop, and will do a manufacturing as well as repair business, and would like to receive from time to time circulars and quotations bearing on this department of their establishment.

Currie Hardware & Furniture Company, Currie, Minn., who are dealers in Hardware, Vehicles and furniture, are desirous of receiving catalogues, &c., relating to the Hardware and Vehicle line.

As appears by a paragraph under "Export Notes," the Flint, Eddy & American Trading Company, 30 Broad street, New York, are desirous of receiving catalogues, &c., relating to manufactures which are exported to the South African colonies. A representative of the company is about to sail for South Africa to take charge of their business in that part of the world, with office at Durban, where they desire to have a pretty complete collection of trade catalogues. Matter sent to the company at the above address should be marked "South African Department."

## LOCKWOOD MFG. COMPANY'S NEW DESIGNS.

**L**OCKWOOD MFG. COMPANY, South Norwalk, Conn., whose direct representatives are Allerton-Clarke Company, 97 Chambers street, New York, have just issued Price-List No. 4 relating to their 1894 catalogue and 1897 portfolio, illustrating and describing fine Locks and Builders' Hardware. It is accompanied by 35 supplementary eyeleted pages containing a large number of new designs in front, vestibule, inside and sliding door sets with and without Cylinder Locks, together with Electric Push Buttons, Letter Box and Push Plates, Door and Drawer Pulls, the various Lifts, &c., for harmoniously trimming modern fine residences, office and public buildings, institutions, &c.

Among the late new designs in cast and wrought bronze metal and iron are the Lynnfield, Ridgefield, Harwich, Chesterfield and Anglure designs, while other patterns but a few months old, and now catalogued for the first time, are the Arcadia, Melrose, Marcellus, Andover, Cambridge, Stanwich and Ardennes designs. There are also shown in new goods Artistic Cabinet Trimmings, Elbow, Screen Door, French Window and Cupboard Catches and Turns, Transom Chains, Sash Plates, Lifts and Locks, Latches, Indicator Bolts and Mortise Locks for toilet trim; Drawer and Door Pulls, Flush and Extension Bolts and Cabin Door Hooks in the various finishes.

In the article entitled "Decision in Enameled Ware Suit," in *The Iron Age* of April 18, a transposition of the names of the Lalance & Grosjean Mfg. Company and the St. Louis Stamping Company gave an erroneous impression. The facts are that after giving a decision in favor of the Lalance & Grosjean Mfg. Company in their suits against the Haberman Mfg. Company, New York, and Matthai, Ingram & Co., Baltimore, for infringement, Judge Coxe handed down a decision dismissing the complaint in the case of the Lalance & Grosjean Mfg. Company against the National Enameling & Stamping Company, the latter company claiming the right to operate under the patent referred to through the license granted them by the St. Louis Stamping Company, instead of Lalance & Grosjean Mfg. Company, as originally printed, one of the co-owners of the said patent. The judge held that inasmuch as this proposition had never been passed upon by the Supreme Court of the United States, and as the majority of decisions of the lower courts in this country is against the view taken by the

complainants, a rule so generally recognized should not be disturbed. The Lalance & Grosjean Mfg. Company have instructed their attorney to appeal this case to the Supreme Court of the United States.

## THE KIRK-TUCKER SPRING COMPANY.

**T**HE KIRK-TUCKER SPRING COMPANY, Cleveland, Ohio, announce the completion of their factory for the manufacture of Coiled Wire Springs, oil tempered. The plant, it is stated, is fully equipped with new and modern machinery. They use the Seth Kirk patent coiling machine, by which, it is said, any liability or variation in the pitch or diameter of the coil is avoided, turning out a perfect Spring. The company state that they use only the best Steel Wire and that all their Springs are fully tested. They manufacture to order Agricultural Springs, Trolley Springs, Valve, Governor, Wagon, Hinge, Furniture and Upholstery Springs, Engine and Mechanical Springs.

## PRICE-LISTS, CIRCULARS, &c.

SIMEON L. & GEO. H. ROGERS COMPANY, Hartford, Conn.: Circular relating to the history of Rogers trademarks and offering reward for information regarding 1847 Rogers Bros. and Star Rogers & Bro. trade-marks.

J. S. WOODHOUSE, 191 Water street, New York: Illustrated pamphlet J, showing specialties in Agricultural Implements for the farm, lawn, garden, &c., culled from their full catalogue H, containing full assortments.

CHICAGO SPRING BUTT COMPANY, Chicago, Ill.: New price-list of their Floor Hinges. They state that they have added a standard japanned finish and corrected the size of door description so as to tally with the real capacity of the Hinges.

CHAS. D. BROWN, 160-162 Duane street, New York: Circular descriptive of the Star Food Chopper, which has a plate ninged at the top of the hopper, which when pressed on the food to be cut forces it upon the feed screw, thus protecting the fingers from injury or soiling.

EAGLE LOCK COMPANY, Terryville, Conn.: Loose pages to be inserted in their catalogue, volume 18. They relate to Sub-Treasury, Brass Secure Lever Wardrobe, Brass Secure Lever Cut Cupboard, Brass and Bronze Suit Case and Sample Case Locks, &c.

WM. CONNORS PAINT MFG. COMPANY, Troy, N. Y.: Net cash price-list for dealers only of American Seal Paints, Varnishes, Japans, &c.

P. & F. CORBIN, New Britain, Conn.: An elegantly printed pamphlet just issued is devoted to the subject of ball bearings as used in Loose Pin Butts, Axle Pulleys and Pin Tumbler Locks of their manufacture.

## TRADE ITEMS.

CATTARAUGUS CUTLERY COMPANY, Little Valley, N. Y., are distributing to the trade for the purpose of calling attention to their Pocket Cutlery a very attractive metal sign, circular in shape and 12 inches in diameter. The design is a striking one, and hung up in a good position in the merchant's store the sign is pretty sure to catch the eye of his patrons.

VOIGHT, STARR & Co., 67 Reade street, New York, jobbers of Hardware, have recently removed to 84-86 Chambers street, where they have much larger accommodations. This house also represent directly the Phoenix Hardware Company, Phoenix, N. Y., and F. A. Howard & Son, Belfast, Maine, who manufacture Spiral Screw Drivers.

J. W. OWEN, formerly with the American Axe & Tool Company, New York, has resigned his position with that company, and with a number of friends is going to Alaska, in the Koogerack district, north of Cape Nome, where they will develop some placer mining claims, located by a prospector who has lived eight years in that country and who is also identified with the enterprise.



## NORVELL-SHAPLEIGH HARDWARE COMPANY.

THE business of the A. F. Shapleigh Hardware Company, St. Louis, Mo., has been acquired by the Norvell-Shapleigh Hardware Company, and the capital stock of the old concern, \$500,000, has been raised to \$1,000,000. The transfer will be consummated on July 1. The officers of the new company are: President, Saunders Norvell; first vice-president, Richard F. Shapleigh; second vice-president, Wm. G. Yantis; third vice-president, Taylor D. Kelley; treasurer, Alfred F. Shapleigh; secretary, Harry B. Gordon; assistant secretary, A. Shapleigh Boyd. The business will be exclusively wholesale and confined to legitimate channels, it being the policy of the management to develop great strength in certain special lines. It is the intention to get out a new catalogue immediately. It is expected that the volume of business transacted by the old company will be largely increased. All of the stock in the company is owned by the seven officers and directors, no stock at all being offered to the public.

The president, Saunders Norvell, is 37 years old. He has been with the Simmons Hardware Company 21 years, working in various departments in the house, in which he began as a stock clerk. He traveled ten years in the West and was called in from the road to take charge of their mail order department, and has had general charge of their sales and salesmen for several years past. Four years ago he was elected third vice-president of the Simmons Hardware Company. The first vice-president of the new company, Richard F. Shapleigh, is well known from his connection with the old concern as a prominent and influential Hardware merchant. The second vice-president, Wm. G. Yantis, 37 years of age, has been 20 years in the Sporting Goods and Cutlery business, 15 of which were with the Simmons Hardware Company as special Sporting Goods salesman and later as buyer and manager of their Sporting Goods department. The third vice-president, Taylor D. Kelley, 38 years old, has been 14 years in the retail Hardware business in Ohio, and for the past seven years was manager of the Railway Supply department of the Simmons Hardware Company. The treasurer, Alfred F. Shapleigh, has been long and prominently identified with the parent concern. Secretary Harry B. Gordon, 39 years old, was formerly in the wholesale and retail Hardware business in Springfield, Mo., but has been with the Simmons Hardware Company five years, at first as traveling representative in Western Missouri, and later as a buyer of Builders' and Shelf Hardware.

While it is true that heads of four departments in the Simmons Company will occupy responsible positions in the new enterprise, we are advised the rumors in circulation that this purchase was made by the Simmons Hardware Company and that the undertaking is backed by them is without any foundation. It will be an entirely separate and distinct corporation, working on absolutely independent lines and building up a business of its own. It is true, however, that only the best of feeling in a personal way exists between the old house and the new one.

The Norvell-Shapleigh Hardware Company will be incorporated July 1, but by June 1 it is expected that all the principals of the new company will be at work in their new offices. They will immediately erect a new building, which will be thoroughly up to date in all its appointments. They hope to occupy it before winter. All the men interested in the company are young, only one, Richard F. Shapleigh, being more than 40 years old. The absorption of this business was originated by Harry B. Gordon, who will be secretary of the new company, the negotiations having been in progress for three weeks and brought to a conclusion April 18.

The business of the A. F. Shapleigh Hardware Company began in 1843, when A. F. Shapleigh, Sr., came to St. Louis from Philadelphia to open a branch house for Rogers Bros. of Philadelphia. Within a few years he bought out the Rogers Brothers' interest, and from that time to the present has held a controlling interest in the business under the various names of Rogers Bros.

& Co., Shapleigh, Day & Co., A. F. Shapleigh & Co., A. F. Shapleigh & Cantwell Hardware Company, and A. F. Shapleigh Hardware Company. Since the recent death of Frank Shapleigh, former vice-president, they have considered the advisability of making changes in the business which would add to its volume and give it even a more prominent position than it has occupied in the trade.

## AMONG THE HARDWARE TRADE.

Wright & Dalton Hardware Company, Poplar Bluff, Mo., on March 8 increased their capital stock from \$50,000 to \$150,000, and changed the style to Wright-Dalton-Bell-Anchor Store Company. The stock is principally owned by the proprietors of the business, and the officers remain unchanged. In addition to Hardware, Stoves, Farm Implements and furniture, they are now carrying all kinds of merchandise. The company advise us that on March 1 they shipped from St. Louis a solid train of 30 cars of general merchandise.

J. M. Shepard has succeeded W. H. Ostrander, Wayne, Kan., dealer in Hardware, Stoves, Tinware, Farm Implements, Sporting Goods, &c.

Having been appointed postmaster of Winthrop, Minn., N. A. Lilyquist has retired from business for the present and disposed of his Hardware and Farm Implement stock to C. J. Larson & Co. and Schweikers & Stockman.

Stressman, Sorenson & Co. have lately entered the Hardware and Farm Machinery business in Winthrop, Minn.

Alexander-Adams Company, Pocahontas, Iowa, who entered business in January last, have lately taken possession of a new brick building, 25 x 100 feet, with plate glass front, steel ceiling, &c.

Bond & Powell, Converse, Ind., announce the death of their senior partner, John Bond, on the 8th inst. Mr. Powell will continue the business under the same firm name at the old stand.

The Hardware business at Fond du Lac, Wis., for many years conducted by W. Wilkie & Son, will hereafter be carried on under the name of Wilkie Hardware Company.

Hutchinson Lumber & Supply Company have lately opened up a strictly wholesale Hardware and Mill Supply business at Valdosta, Ga.

W. W. Greiner and L. S. Ricketts will open a retail Hardware store at Orange, Va., about May 1. The style of the firm will be Greiner & Ricketts. They will carry a general line of Heavy and Shelf Hardware, Cutlery, Guns, Stoves and Tinware, Carriage and Wagon Material, Pumps, Sash, Doors and Blinds, Saw Mill Supplies and Hay Tools. Mr. Greiner, who has had seven years' experience in the retail business, having been connected with the Orange Hardware Company, formerly Cox & Co., of Orange, will manage the store and give it his entire attention. Mr. Ricketts is a well-known druggist of Orange and will continue in that line, being only financially interested in the Hardware firm.

Schulmerich Bros. have purchased the Bailey Block in Hillsboro, Ore., and after making necessary repairs and alterations will occupy it with a stock of Hardware and Agricultural Implements.

W. A. Crandall is successor to J. W. Dunaway in the Hardware, Stove and Agricultural Implement business in Overton, Neb.

Echols-Smith Hardware Company, wholesale Heavy Hardware, Mill, Mine and Furnace Supplies, Birmingham, Ala., have taken possession of their new establishment.

The store of the Fisher Hardware Company, Wapakoneta, Ohio, suffered \$1000 worth of damage by fire a short time since. The loss was fully covered by insurance.

Mrs. S. E. Case has disposed of her Hardware store at Ripley, O. T., to Dale Lytton, who also conducts a store at Stillwater.

The Geo. H. Baker Company, New Haven, Conn., have incorporated with a capital stock of \$4000, paid in. They are dealers in Shelf Hardware, Tinware, House Furnishing Goods, Crockery, Glassware, Seeds, &c.

A. W. Lieb & Co. have succeeded F. H. Keller & Co., Williamsport, Pa. Mr. Lieb has been identified with the Hardware line for 27 years, the last 16 of which as partner of the late F. H. Keller.

Mineral Wells Hardware & Implement Company, Mineral Wells, Texas, have bought out C. P. Hollingsworth & Co., Graham, Texas, and will run the business as a branch store under the style of Graham Hardware Company.

Mason & Wall Company, Daytona, Fla., have disposed of their grocery department and will hereafter devote their attention to Hardware, Crockery, Glassware, Sash, Doors, Blinds, Paints, Oils, Grain, &c.

Percy G. James, 336 Fulton street, Jamaica, N. Y., has recently built himself a fine new store, the structure being known as the James building. It is 36 feet wide and 60 feet deep, two stories and basement. The main floor is used for shelf goods principally, and is trimmed with North Carolina pine, natural finish. The basement is concreted, lighted on three sides and especially well ventilated by three 7-inch cast iron pipes leading from the floor to the surface out doors, so as to prevent condensation and damage by rust. In the near future he will erect a warehouse in the rear of the store on land reserved for that purpose in which to carry reserve stock, when the basement will be used mainly for displaying goods not in keeping with the street floor. The goods dealt in include general lines of Shelf and Builders' Hardware, Fire Arms, Cutlery, Paints, Oils and Varnishes, Carriage Wood and Iron, Glass, Iron, Steel and Agricultural Implements. The building is steam heated, electrically lighted, and has two large show windows, the upper floor being rented for office use. Mr. James bought out this business, which had been established 70 years on one site, two years ago, having previously been in the employ of Hartley & Graham, New York.

Henry Ruppel, who has been connected with the Dangler Stove & Mfg. Company, Cleveland, Ohio, for 15 years, is about to embark in the Hardware and Stove business under the firm name of Ruppel Hardware Company, at corner of Willson and Payne avenues, Cleveland.

J. A. Anderson has lately opened up in business at Guthrie, O. T., handling at retail a line of Shelf and Heavy Hardware, Stoves and Tinware, Blacksmiths' Materials, &c.

Frank Kieferle has recently embarked in the Hardware, Stove, Farm Implement and Sporting Goods business at Marlon, Kan.

Mitchell-Phillips Hardware Company is the style of a new house at Warren, Pa. Their line embraces Shelf Hardware, Stoves and Tinware, Agricultural Implements, Sporting Goods, Sewer Pipe, Tin Roofing, Plumbing, &c.

The Hardware and grocery stock of J. H. Duncan, Duncan, I. T., was damaged by fire a short time since to the extent of \$500, the loss being fully covered by insurance.

C. F. Hendrie has purchased the business formerly conducted by G. B. Vaughn & Co., Wray, Col.

## CONTENTS.

	PAGE.
The Largest Steel Grain Elevator. Illustrated.....	1
Instructions for Shipping Steel Structure for Export .....	5
The Cosgrave Process for the Making of Compound Ingots.....	5
The Bartlett-Kent Process for Rolling Seamless Pipe. Illustrated..	6
A Great Engineering Consolidation.....	9
Manufacturers' Association of Bridgeport, Conn.....	9
The Prospects for Economical Automobiling.....	10
Die Grinder. Illustrated.....	12
The Bessemer Steel Industry in the United Kingdom .....	12
Industrial Crisis in Scotland.....	13
The Pratt & Whitney Weighted Engine Lathe. Illustrated.....	14
A New Bascule Bridge .....	14
The Molders' Wages.....	14
The Russian Tariff Trouble.....	15
Lake Iron Ore Matters.....	16
The Illinois Tube Works .....	17
The Iron Age Index Supplement.....	17
The Largest Emery Wheel.....	17
Notes from Great Britain.....	18
The New Ore Carrying Fleet of 1901 .....	20
A Chicago and European Steamship Line.....	22
The McKeesport Strike.....	22
Editorials:	
The Balance of Trade Settlements .....	23
Queer Legislation Attempted in Illinois.....	23
A Severe Chicago Verdict. ....	24
The National Standardizing Bureau.....	24
The National Tube Company.....	25
Wm. Jessop & Sons, Limited.....	25
Central American News.....	25
United States Steel Corporation Coke Properties .....	26
Changes Among Reading Iron Company Officials.....	26
Pittsburgh Freights .....	26
New Publications.....	26
The Sharon Steel Company.....	27
Obituary .....	27
Manufacturing:	
Iron and Steel. ....	28
Machinery.....	28
Foundries .....	29
Buildings and Bridges.....	30
Hardware .....	30
Miscellaneous .....	30
The Iron and Metal Trades:	
A Comparison of Prices.....	31
Chicago.....	31
Pittsburgh.....	33
Philadelphia.....	34
St. Louis.....	35
Cincinnati.....	36
Birmingham.....	36
The German Iron Market.....	36
New York .....	37
Metal Market.....	38
The New York Machinery Market.....	39
Trade Publications.....	40
The Iron and Steel Production in France.....	40
Iron and Industrial Stocks .....	41
The Philadelphia Machinery Market.....	42
The Cleveland Machinery Market.....	43
Correspondence.....	45
The Trenton Falls Power Plant .....	45
The Columbia Coke Company.....	46
Jones & Laughlins, Limited, Buy Ore Properties .....	46
American Bridge Appointments.....	46
Personal.....	46
Hardware:	
Condition of Trade.....	47
Notes on Prices.....	47
Death of John D. Seeberger. Portrait .....	49
Work of Retail Hardware Organizations.....	50
Standard Paint Company.....	50
Notes on Foreign Trade .....	51
Letters from the Trade .....	53
Death of Elias C. Atkins. Portrait .....	54
Show Window Display. Illustrated .....	55
Basement Sash Weight Bins. Illustrated.....	56
Rules for the Hardware Store.....	57
The Retail Hardware Merchants' Pamphlets, Circulars, &c. Ill.	58
Rochester Mechanics' Institute.....	59
Requests for Catalogues, &c.....	60
Lockwood Mfg. Company's New Designs. ....	61
The Kirk-Tucker Spring Company.....	61
Price-Lists, Circulars, &c .....	61
Trade Items.....	61
Norvell-Stapleigh Hardware Company.....	61
Among the Hardware Trade.....	61
Oriental Enameled Stove Boards. Illustrated. ....	63
The Hetzel Knife and Scissors Sharpener. Illustrated .....	63
Wagner Improved Broiler. Illustrated .....	63
The Queen Take Down Air Rifle. Illustrated .....	63
The Gatewood Patent Lap Link. Illustrated.....	64
Improved Lemon Squeezer. Illustrated.....	64
Walker's Champagne Tap. Illustrated.....	64
Electric Lighting Boards .....	64
Current Hardware Prices .....	65
Current Metal Prices.....	72



### Oriental Enameled Stove Boards.

The accompanying illustration represents Oriental enameled stove boards, offered by the Wabash Screen Door Company, Rhinelander, Wis. The base of the board is sheet steel, enameled and lithographed to repre-



*Oriental Enameled Stove Boards.*

sent mosaic tiled floor, inlaid in four colors—slate, buff, green and brown. The enamel is baked under a high degree of heat, producing, it is stated, a finish which will not burn, fade or scale.

### The Hetzel Knife and Scissors Sharpener.

The Hetzel Mfg. Company, Pittsburgh, Pa., are putting on the market the knife and scissors sharpener shown herewith. It has a frame of malleable iron, japanned, tinned or nickel plated. The disks are of tool steel, thoroughly tempered, with square edges. Knives are sharpened by drawing the edge between the disks, at a slight angle, right and left. Scissors are sharpened by placing the blade against the guide at the end of the frame,



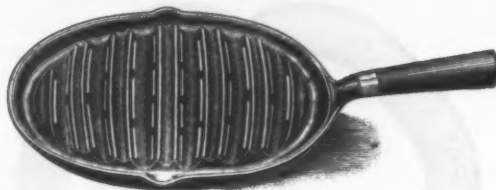
*The Hetzel Knife and Scissors Sharpener.*

and drawing the edge of the blade over the disk. The disks are held in the frame by screws, so if any portion of the disks becomes dull or worn they may be slightly

ers state that with the device carvers, table cutlery; kitchen, bread, butter, silver plated and patent bread knives may be sharpened, also scissors, and that the sharpener will last indefinitely.

### Wagner Improved Broiler.

The Wagner Mfg. Company, Sidney, Ohio, are manufacturing the new Wagner improved broiler, illustrated herewith. The broiler is made in one piece and can be used with equal results on gas, gasoline or ordinary cook stoves. The channels for catching the juices of the meat, it is claimed, do the work perfectly, and the openings to allow the heat to pass through, being only on the sides of the raised channels, do not allow any of the juices to



*Wagner Improved Broiler.*

escape, but preserve them all. The long wooden handle is also a feature that is appreciated by those who use the utensil.

### The Queen Take Down Air Rifle.

The Markham Air Rifle Company, Plymouth, Mich., are offering the new air rifle shown in the accompanying illustration. The stock is selected black walnut,



*The Queen Take Down Air Rifle.*

turned, bringing a new sharpening surface into use. It is also remarked that when the edges of the disks become worn all around they can be removed from the frame and the edges ground, when they will be practically in the same condition as originally. The manufactur-

with metal portions of the rifle well finished, measuring 34 inches over all. It is referred to as being a little heavier than the company's other rifles, and the bar-

rel as being instantly removed for shooting regular air gun darts or for cleaning. The rifle also shoots ordinary B B shot. Each rifle is packed in a box 4½ inches wide by 14 inches long, the rifle being taken apart for packing.

### The Gatewood Patent Lap Link.

The accompanying cuts relate to a lap link offered by the National Lap Link Company, Memphis, Tenn. The



Fig. 1.—The Gatewood Patent Lap Link.

link is referred to as easily opened and closed, and at the same time cheap, durable and simple. It is made in sizes



Fig. 2.—Gatewood Lap Link, Open.

from  $\frac{1}{4}$  to 1 inch, to meet the demand for all purposes for which links are used.

### Improved Lemon Squeezer.

The accompanying cut represents an improved form of Walker's Quick and Easy lemon squeezer, offered by

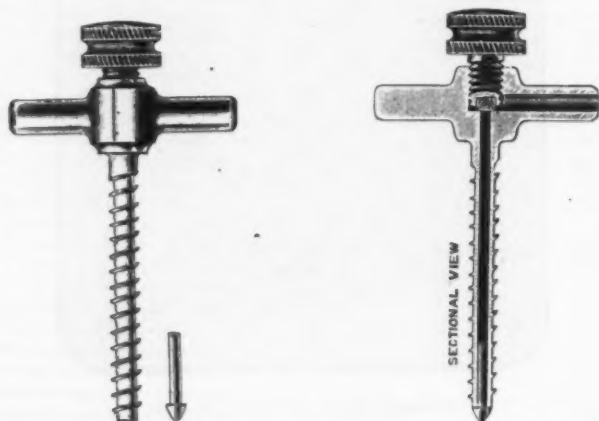


Improved Lemon Squeezer.

the Erie Specialty Company, Erie, Pa. As now made the squeezer has a glass juice receiver that receives the juice after being squeezed under an aluminum crusher in an aluminum cup before entering the tumbler. This prevents the juice coming in contact with the iron metal, insuring purity and cleanliness. It is pointed out that the parts of the squeezer are adjustable, so that the fruit can be squeezed as dry as it is desired.

### Walker's Champagne Tap.

The Erie Specialty Company, Erie, Pa., are putting on the market Walker's Quick and Easy champagne tap, as shown in the accompanying cuts. The small point, which is made of tin, falls into the bottle after the tap is inserted, to insure a free flow of the liquid. By removing the screw valve it is easily cleansed, it is remarked, this being referred to as an important feature in sickrooms and hospitals. The manufacturers state that the tap is absolutely gas tight. It is light and small,



Walker's Champagne Tap.

each one being packed in a fancy box with gimlet and half dozen of the small points, with full directions for use.

### Electric Lighting Boards.

An exhibition was given recently in New York of electric lighting boards and strips by which to obtain electrical effects through the medium of specially prepared surfaces. The purpose of the invention is to provide a board or surface onto which electric lamps can be applied at any point in any shape or form, and moved from point to point with ease, and without special wiring or other installation of special appliances. The shape of the board is immaterial, and its dimensions can be varied to such an extent that one of the developments already arrived at is a narrow electric lighting strip of any length, which is made flexible or rigid as desired.

The particular feature of this system is in the fact that incandescent lamps, standard lamps, wall plugs, ceiling plugs, &c., can be supported by these boards and strips, and at the same time make perfect contact on any part of a prepared surface, doing away entirely with lamp holders, sockets, tapping, &c., thereby reducing the cost of material and labor greatly.

The method by which contact is effected is the preparation of a surface by means of fine copper wires running back and forth across the board, or through strips, in such a way that special copper spikes or pins, about  $1-16 \times \frac{1}{2}$  inch, attached to the base of an incandescent lamp, plug, &c., if pressed in and home through this prepared surface at any desired spot will obtain support in the permeable substance of the surface and instantaneously make a thorough electrical contact with the conducting material underneath.

The boards, strips, coils, &c., are fire and damp proof, and so insulated as to prevent a short circuit. The system, it is claimed, can be used for lighting window displays, showrooms, offices, factories, &c., where it is frequently necessary to quickly alter the position of lights, and for many other purposes, practical and decorative. The system is an English invention, which it is proposed to develop and put on the market in this country.

J. L. Lawrence & Sons have discontinued their Newton, N. J., store and removed the stock to their Decker-town establishment.



# Current Hardware Prices.

REVISED APRIL 23, 1901.

**General Goods.**—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

**Special Goods.**—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

**Range of Prices.**—A range of prices is indicated by means of the symbol @. Thus 33½@33¼&10% signifies that the price of the goods in question ranges from 33½ per cent. discount to 33¼ and 10 per cent. discount.

**Cut Prices.**—In the present condition of the market there is a good deal of cutting of prices by the jobbing trade, whose quotations are often lower than those of the manufacturers.

**Names of Manufacturers.**—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE INDEX SUPPLEMENT (May 3, 1900), which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

**Standard Lists.**—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

**Additions and Corrections.**—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

## Adjusters Blind—

Domestic, ½ doz. \$3.00...33½@33¼&10%  
North's... 99@94½  
Zimmerman's—See Fasteners, Blind.

## Window Stop—

Ives' Patent... 25&5½  
Taplin's Perfection... 99@94½

**Ammunition**—See Caps, Cartridges, Shells, &c.

## Anvils—American—

Eagle Anvils... 7½@7¼  
Hay-Budden, Wrought... 99@94½  
Horseshoe brand, Wrought... 99@94½  
Samson... 7½@7¼  
Trenton, Wrought... 8¼@8½

## Imported—

Armitage's Mouse Hole... 8¼@8½  
Peter Wright's... 99@94½

**Anvil, Vise and Drill—**  
Mills Falls Co., \$18.00... 90%

**Apple Parers**—See Parers, Apple, &c.

## Aprons, Blacksmiths'—

Hull & Hoyt Co.  
Lots of 1 doz... 25%  
bma or Lots... 25%  
Lots of 3 doz... 30%

## Augers and Bits—

Com. Double Spur... 70¢@10¢

Boring Machine Augers... 60¢@10¢@70¢@10¢

Car Bits, 12-in. twist... 60¢@60¢@10¢

Jennings' Pattern... 60¢@10¢@10¢

Auger Bits... 60¢@10¢@10¢

Ford's Auger and Car Bits... 40¢@10¢@10¢@10¢

Forster Pat. Auger Bits... 25%

C. E. Jennings & Co.  
No. 10 ext. lip. R. Jennings' list... 40%

No. 30, R. Jennings' list... 50%

Baswell Jennings... 25¢@10¢@2½¢

L'Hommiedieu Car Bits 15¢@10¢@15¢@10¢

Pugh's Black... 20%

Pugh's Jennings' Pattern... 35%

Small's Auger Bits... 90%

Small's Bell Hangers' Bits... 50%

Small's Car Bits, 12-in. twist... 60%

Wright's Jennings Bits (R. Jennings' list)... 50%

**Bit Stock Drills—**  
Standard list... 65¢@65¢@5%

**Expansive Bits—**  
Clark's small, 1½: large, \$28... 50¢@10¢

Larigne's Clark's Pattern, No. 1, ½ doz., \$28; No. 2, \$18... 50¢@10¢

C. E. Jennings & Co., Steer's Pat... 33½¢

Swan's... 6%

**Gimlet Bits—**  
Common Double Cut, gro. \$2.25@2.75

German Pattern... gro. \$3.25@4.50

Double Cut, makers' lists... 50¢@50¢@10%

**Hollow Augers—**  
Bonney Pattern, per doz. \$11.00@11.50

Ames... 25¢@10%

New Patent... 25¢@10%

Universal... 20%

**Ship Augers and Bits—**  
Ford's... 40%

Small's... 40%

C. E. Jennings & Co... 40%

L'Hommiedieu's... 15¢@10%

Watrous... 40%

**Awl Hafts, See Hafts, Awl.**

**Awls—**  
Brad Awls:  
Handled... gro. \$2.75@3.10

Unhandled, Shouldered gro. \$3.65@6.65

Unhandled, Patent... gro. 60¢@70¢

Peg Awls:  
Unhandled, Patent... gro. 31¢@3½¢

Unhandled, Shouldered gro. \$5.65@70¢

Scratch Awls:  
Handled, Common, gro. \$3.50@4.00

Handled, Socket, gro. \$11.50@12.00

**Awl and Tool Sets**—See Sets, Awl and Tool.

**Axes—**  
First Quality, best brands, \$5.50@5.75

First Quality, other brands, \$5.25@5.50

Jobbers' Special Brands:  
Good Quality... \$5.00@5.25

Best Quality... \$5.25@5.75

Cheap, Handled Axes... \$5.50@5.75

Beveled, add 25¢ doz.

**Axle Grease**—See Grease, Axle.

**Axles—**  
Concord, Loose Collar... 4¼@5¢

Concord, Solid Collar... 5¢@5½¢

No. 1 Common... 3¼@3½¢

No. 1 4 Com. New Style... 3¼@3½¢

No. 2 Solid Collar... 4¼@4½¢

Nos. 11 to 14... 70¢@75¢

Nos. 15 to 18... 60¢@10¢@60¢@10¢

Nos. 19 to 22... 75¢@75¢@10%

**Boxes, Axle—**  
Common and Concord, not turned... 15. 5¢

Common and Concord, turned... 15. 7¢

Half Patent... 15. 9¢

**Balances—**  
Caldwell new list... 50%

Pullman's... 60%

**Spring—**  
Spring Balances... 5¢@10¢@50¢@10¢@5%

Chatillon's Light Sng. Balances... 40¢@10%

Chatillon Straight Balances... 40%

Chatillon Circular Balances... 50%

Chatillon's Large D. a... 80%

**Barb Wire—**  
Wire, Barb.

**Bars—**  
Crow—

Steel Crowbars, 10 to 47 lb., per lb... 2 90¢@3.10¢

**Beams, Scale—**  
Scale Beams, list Jan. 12, '93, 30¢@10%

Chatillon's No. 1... 30%

Chatillon's No. 2... 40%

**Beaters—**  
Egg—

Standard Co.:  
No. 5 Steel Handle Dover, ½ gro. \$6.50

No. 10 Cast Handle Dover, ½ gro. \$8.00

No. 10 Steel Handle Dover, ½ gro. \$8.00

No. 15 Extra Heavy Steel Handle, ½ gro. \$15.00

Rival, ½ gro. \$11.00

Taplin Mfg. Co. ½ gro. \$17.00

No. 50 Small Family size... \$8.50

No. 100 Regular Family size... \$8.00

No. 102 Regular Family size tinned... \$9.50

No. 150 Large Family size... \$15.00

No. 152 Large Family size, tinned... \$17.00

Lyon's Standard size... ½ doz. \$1.75

Wunder (S. & Co.)... ½ doz. \$1.75

**Bellows—**  
Blacksmith, Standard list, 70¢@70¢@10%

C. E. Jennings & Co., Blacksmith... 60¢@10%

C. E. Jennings & Co., Hand... 33½¢

**Blacksmiths—**  
Inch... 30 32 34 36 38 40

Eac... \$3.50 3.75 4.25 4.50 5.35 6.15

Extra Length:  
Each... \$4.00 4.55 5.10 5.60 6.40 7.50

**Molders—**  
Inch... 9 10 11 12 14 16

Doz... \$6.75 7.25 8.50 9.50 12.00 14.50

**Hand—**  
Inch... 6 7 8 9 10 12

Doz... \$3.75 4.25 4.50 5.00 5.7 6.75

**Bells—**  
Cow—

Ordinary goods... 75¢@5¢@75¢@10%

High grade... 70¢@70¢@10%

Jersey (S. & Co.)... 75¢@10%

Texas Star... 50¢@10%

**Door—**  
Abbe's Gong... 45%

Barton Gong... 25%

Home, R. & E. Mfg. Co.'s... 65¢@10%

Lever and Pull, Sargent's... 90¢@10¢@10%

**Hand—**  
Hand Bells, Polished... 60¢@60¢@10%

White Metal... 65¢@55¢@10%

Nickel Plated... 50¢@50¢@10%

Silver... 60%

Silver Chime... 85¢@95¢@10%

**Miscellaneous—**  
Farm Bells... 10 20 30 40

Steel Alloy Church and School... 60¢@10¢@60%

Willmot & Hobbs Mfg. Co. Gongs... 70%

**Belting—**  
Rubber—

Agricultural (Low Grade), 75¢@10¢@90%

Common Stand. rd... 75¢@75¢@10%

Standard... 70¢@70¢@10%

Extra... 60¢@10¢@5%

High Grade... 50¢@10¢@50¢@10¢@5%

Seamless Stretched, Imperial... 80¢@5%

Boston... 80¢@5%

Niagara... 80¢@5%

**Leather—**  
Extra Heavy, Short Lap... 50¢@10¢@60%

Regular Short Lap 60¢@10¢@60¢@10¢@5%

Standard... 60¢@10¢@10¢@70¢@5%

Light Standard... 70¢@70¢@10%

**Cotton—**  
Rosendale-Reddaway B. & H. Co.:  
Sphinx B-and... 80¢@10%

Durable Brand... 70%

**Bench Stops—**  
See Stops, Bench

**Benders and Upsetters, Tire—**  
Green River Tire Benders and Upsetters... 30%

Stoddard's Lightning Tire Upsetters... 40¢@50%

**Bicycle Goods—**  
John S. Lang's Son's 1899 list:  
Chain... 50%

Parts... 50%

Spokes... 50%

Tub's... 60%

**Bits—**  
Auger, Gimlet, Bit Stock Drills, &c.—  
See Augers and Bits.

**Bit Holders—**  
See Holders.

**Blind Adjusters—**  
See Adjusters, Blind.

**Blind Fasteners—**  
See Fasteners, Blind.

**Blind Staples—**  
See Staples, Blind.

**Blocks—**  
Tackle—

Common Wooden... 70¢@70¢@10%

Cleveland Steel, Mal. Iron... 50¢@10¢@60¢@10%

Ford's Star Brand Self Lubricating... 60¢@10%

Hollow Steel, Ford's Pat. Star Brand... 50¢@10%

Lane's Patent Automatic Look and Jun... 30%

Stowell's Novelty, Mal. Iron... 50%

See also Machines, Hoisting.

**Boards Stove—**  
Zinc, Crystal, &c... 40¢@10¢@%

**Boils—**  
Carriage, Machine &c.—

Common, list Jan. 31, '95... 65¢@10¢@%

Norway Iron, \$3.00, list Oct. 7, '94... 75¢@75¢@10%

Phila. Eagle, \$3.00 list May 24, '99... 80¢@80¢@10%

Bolt Ends, list Jan. 31, '95, 70¢@75¢@%

Machine, list Oct. 1, '99... 70¢@75¢@%

Machine with C. P. C. & T. Nuts... 65¢@12½¢

**Door and Shutter—**  
Cast Iron Barrel, Round Brass Knob:  
Inch... 3 4 5 6 8

Per doz... \$2.33 2.38 2.5 2.7 3.0

Cast Iron Spring Foot:  
Inch... 6 8 10

Per doz... \$1.00 1.25 1.75

Cast Iron Chain, Flat, Japanned:  
Inch... 6 8 10

Per doz... \$0.85 1.00 1.50

Cast Iron Shutter, Brass Knobs:  
Inch... 6 8 10

Per doz... \$0.60 1.00 1.15

Wrought Barrel Brass Knob:  
Inch... 3 4 5 6 8

Per doz... \$0.44 50 61 70 1.23

Wrought Barrel... 70¢@10¢@75¢@5%

Wrought... 40¢@50¢@10%

Wrought Flush B. K. 50¢@10¢@60¢@10%

Wrought Shutter... 40¢@10¢@10¢@60¢@10%

Wrought Square Neck... 50¢@50¢@10%

Wrought Sunk... 50¢@50¢@10%

Ives' Patent Door... 60%

**Stove and Plow—**  
Plow... 60¢@10¢@%

Stove... 75¢@75¢@10%

**Tire—**  
Common... 75¢@75¢@10%

American Srew Company:  
Norway Phila., list Oct. 16, '94... 75%

Eagle Phila., list Oct. 10, '94... 85%

Bay State, list Dec. 28, '99... 75%

Franklin Moore Co.:  
Norway Phila., list Oct. 16, '94... 75%

Eagle Phila., list Oct. 16, '94... 85%

Eclipse, list Dec. 28, '99... 75%

Port Chester Bolt & Nut Company:  
Empire, list Dec. 28, '99... 75%

Keystone Phila., list Oct. '94... 85%

Norway Phila., list Oct. '94... 75%

## Borers, Tap—

Borers Tap, Ring, with Handle:  
Inch... 1 1½ 2 2½ 3 3½ 4 4½ 5 5½ 6 6½ 7 7½ 8 8½ 9 9½ 10 10½ 11 11½ 12 12½ 13 13½ 14 14½ 15 15½ 16 16½ 17 17½ 18 18½ 19 19½ 20 20½ 21 21½ 22 22½ 23 23½ 24 24½ 25 25½ 26 26½ 27 27½ 28 28½ 29 29½ 30 30½ 31 31½ 32 32½ 33 33½ 34 34½ 35 35½ 36 36½ 37 37½ 38 38½ 39 39½ 40 40½ 41 41½ 42 42½ 43 43½ 44 44½ 45 45½ 46 46½ 47 47½ 48 48½ 49 49½ 50 50

**Carpet Stretchers—**

See Stretchers, Carpet.

**Cartridges—**

B. B. Caps, Con. Ball Sngd.	.....\$1.90
B. B. Caps, Round Ball.	.....\$1.15 @ 1.18
Blank Cartridges:	
22 C. F., \$6.50.	.....10¢55
28 C. F., \$7.00.	.....10¢55
22 cal. Rim., \$1.50.	.....10¢55
28 cal. Rim., \$2.75.	.....10¢55
Central Fire.	.....25¢
Pistol and Rifle.	.....15¢55
Primed Shells and Bullets.	.....15¢55
Rim Fire Sporting.	.....60¢
Rim Fire, Military.	.....15¢55

**Castors—**

Bed.	.....70¢70¢10¢
Plate.	.....75¢75¢10¢
Philadelphia.	.....75¢75¢10¢
Boss.	.....70¢10¢
Boss Anti-Friction.	.....70¢10¢
Martin's Patent (Phoenix).	.....45¢
Payson's Anti-Friction.	.....70¢10¢10¢
Standard Ball Bearing.	.....45¢
Tucker's Patent, low list.	.....80¢

**Cattle Loaders—**

See Loaders, Cattle.

**Chain—**

2-16	5-16	7-16	14	9-16
7.45	8.55	8.65	9.70	9.85
1/4	3/4	1/2 to 1	1 1/2 to 1 3/4 inch.	
8.40	8.55	8.50	per lb.	5.50 per 100 lb.
Less than Cast lots add 55c.				
German Coil, list July 21, '97, 80¢10¢10¢				
German Hammer Chain, list July 21, '97, 80¢10¢10¢				
Traces, Western Standard: 100 pair				
6 1/2-6 3/4, Straight, with ring.	.....\$35.00			
6 1/2-6 3/4, Straight, with ring.	.....\$27.00			
6 1/2-6 3/4, Straight, with ring.	.....\$31.00			
6 1/2-10 1/2, Straight, with ring.	.....\$34.50			
Add 1/2¢ per pair for Hooks.				
Trucks Traces 1/2¢ per pair higher than Straight Link.				

Trace, Wagon and Fancy Chains.	
Eastern list.	.....60¢60¢55¢
Jack Chain, list July 10, '93:	
Iron.	.....60¢60¢10¢
Brass.	.....60¢60¢10¢
Safety Chain.	.....70¢55¢70¢10¢
Gal. Pump Chain.	.....lb 1 1/4 @ 1 3/4
Covert Sled Works:	
Breast, Hitching and Rein Chains.	50¢

Covert Hfg. Co.:	
Breast.	.....35¢25¢
Halter.	.....35¢25¢
Reel.	.....35¢25¢
Rein.	.....35¢25¢
Stallion.	.....35¢25¢

Onelida Community:	
Eureka Coil and Halter.	.....60¢60¢55¢
Niagara Coil and Halter.	.....60¢60¢55¢
Niagara Cow Ties.	.....45¢55¢45¢10¢55¢
Am. Coil and Halter.	.....50¢10¢55¢60¢
Am. Cow Ties.	.....55¢55¢40¢55¢
Wire Goods Co.:	
Dog Chain.	.....60¢10¢
Universal Jbi-Jointed Chain.	50¢

**Chalk—(From Jobbers.)**

Carpenters', Blue.	.....gro. 15¢
Carpenters', Red.	.....gro. 40¢
Carpenters', White.	.....gro. 35¢

See also Crayons.

**Chalk Lines—See Lines.****Checks, Door—**

Bardsley's.	.....40¢10¢
Columbia.	.....50¢10¢
Belipse.	.....60¢60¢10¢

**Chests, Tool—**

American Tool Chest Co.:	
Boys' Chests, with Tools.	.....55¢
Youths' Chests, with Tools.	.....40¢
Gentlemen's Chests, with Tools.	.....30¢
Farmers', Carpenters', etc., Chests,	
with Tools.	.....30¢
Machinists' and Pipe Fitters' Chests,	
Empty.	.....60¢
C. E. Jennings & Co.'s Machinists' Tool	
Chests.	.....30¢

**Chisels—**

Socket Framing and Firmer	
Standard List.	.....70¢70¢10¢
Buck Bros.	.....30¢
Charles Buck	.....30¢
C. E. Jennings & Co. Socket Firmer	
No. 10.	.....40¢10¢
C. E. Jennings & Co. Socket Framing	
No. 15.	.....60¢10¢
Swan's.	.....70¢25¢
L. & J. J. White.	.....80¢30¢25¢

**Tanged—**

Tanged Firmers.	.....60¢55¢40¢10¢
Buck Bros.	.....85¢
Charles Buck.	.....85¢
C. E. Jennings & Co. Nos. 19, 181.	.....25¢
L. & J. J. White, Tanged.	.....35¢25¢

Cold Chisels, good quality, lb.	13 @ 15¢
Cold Chisels, fair quality, lb.	11 @ 12¢
Cold Chisels, ordinary, lb.	8 @ 9¢

**Chucks—**

Beach Pat., each \$8.00.	.....30¢
Massey's Planer and Milling.	.....15¢20¢
Skinner Patent Chucks:	
Combination Lathe Chucks.	.....40¢
Drill Chucks, Patent and Standard.	.....25¢
Drill Chucks, New Model.	.....25¢
Independent Lathe Chucks.	.....40¢
Improved Planer Chucks.	.....40¢
Universal Lathe Chucks.	.....40¢
Face Plate Jaws.	.....35¢
Standard Tool Co.	
Improved Drill Chuck.	.....45¢
Union Mfg. Co.:	
Combination.	.....40¢
Csar Drill.	.....30¢
Geared Scroll.	.....30¢
Independent.	.....40¢
Union Drill.	.....30¢
Universal.	.....40¢
Face Plate Jaws.	.....35¢

**Clamps—**

Adjustable, Hammers.	.....90¢20¢55¢
Cabinet, Sargent's.	.....50¢10¢
Carriage Makers', P. S. & W. Co.	40¢10¢
Carriage Makers' Sargent's.	.....50¢10¢
Best, Parallel.	.....35¢40¢10¢
Lineman's, Ulica Drop Forge & Tool	
Co.	.....40¢
Saw Clamps, see Files, Saw Mfgs.	

**Cleaners Walk—**

Star Socket, All Steel.	.....\$4.00 net
Star Shank, All Steel.	.....\$3.75 net
W. & C. Snaar, All-steel, 7 1/4 in. x d in.	
\$3.35; 8 in., \$3.40; 9 1/4 in., \$3.50.	

**Cleavers, Butchers—**

Posters Bros.	.....30¢
New Haven Edge Tool Co.'s.	.....40¢10¢
Fayette R. Plumb.	.....55¢40¢10¢
P. S. & W.	.....35¢45¢35¢10¢
L. & J. J. White.	.....25¢

**Clippers—**

Chicago Flexible Shaft Company:	
Handy Toilet.	.....\$7.30
Mascotte Toilet.	.....\$3.40
Monitor Toilet.	.....\$9.00
Stewart's Patent.	.....\$10.00

**Clips Axle—**

Eagle and Superior 1/4 and 5-16	
inch.	.....70¢10¢
Norway, 1/4 and 5-16 inch.	.....70¢70¢10¢

**Cloth and Netting, Wire—**

See Wire, &amp;c.

**Cocks, Brass—**

Hardware list (Globe, Kerosene,	
Racking, &c.)	.....65¢10¢
Coffee Mills—See Mills, Coffee.	
Collars Dog—	
Brass, Pope & Stevens' list.	.....40¢
Embossed, Gilt, Pope & Stevens' list.	80¢10¢
Leather Pope & Stevens' list.	.....40¢

**Compasses Dividers, &c.**

Ordinary Goods.	.....70¢10¢75¢
Bemis & Call Hdw. & Tool Co.:	
Dividers.	.....65¢
Callipers, Call's Patent Inside.	.....55¢
Callipers, Double.	.....65¢
Callipers, Inside or Outside.	.....65¢
Callipers, Wing.	.....60¢
Compasses.	.....60¢
J. Stevens A. & T. Co.	.....55¢10¢

**Compressors Corn Shock—**

J. B. Hughes' #100.

**Conductor Pipe, Galvanized—**

L. C. L. to Dealers:

Territory.	Not needed.	Needed.
Eastern.	70¢7 1/4¢	70¢10¢
Central.	70¢5¢	70¢7 1/4¢
Southern.	65¢5 1/4¢	65¢5¢
S. Western.	60¢13 1/4¢	60¢15¢

Terms: 25 for cash.

Jobbers receive extra 13 1/4¢ on car-

loads loose, and extra 13 1/4¢ on car-

loads crated.

See also Eave Troughs.

**Coolers, Water—**

Labrador \$11.50	\$14.00	\$17.50	\$20.00
8 gal.			
\$24.00			
No. 1.	3	4	6
Iceland.	\$23.00	\$25.00	\$30.00
10	14 gal.		
\$27.00	\$32.00		

**Coopers' Tools—**

See Tools, Coopers'.

**Cord—Sash—**

Braided, Drab.	.....lb. 25¢
Braided, White, Common.	15¢7 1/4¢
Cable Laid Italian.	lb. A, 15¢; B, 18¢
Common India.	lb. 9 @ 9 1/4¢
Cotton Sash Cord, Twisted.	19¢10¢
Patent Russia.	lb. 12 1/4¢
Cable Laid Russia.	lb. 13 1/4¢
India Hemp, Braided.	lb. 14¢
India Hemp, Twisted.	lb. 10¢15¢
Patent India, Twisted.	lb. 10¢15¢
Pearl Braided, cotton.	lb. 17¢18¢
Massachusetts, White.	lb. 20¢
Massachusetts, D. ab.	lb. 20¢
Eddystone Braided Cotton.	lb. 19¢
Harmony Cable Laid Italian.	lb. 18¢
Ossawann Mills:	
Crown, Solid Braided White.	lb. 18¢
Braided, Giant, White.	lb. 17¢
Peelers:	
Cable Laid Italian.	.....10¢
Cable Laid Russian.	.....14¢
Cable Laid India.	.....12¢
Braided India.	.....12¢
Phoenix, White.	.....10¢
Samson:	
Braided, Drab Cotton.	.....\$ 32 1/4¢
Braided, Italian Hemp.	.....\$ 32 1/4¢
Braided, Linen.	.....\$ 40¢
Braided, White Cotton, Spot.	.....\$ 38 1/4¢
Silver Lake:	
A quality, Drab, 40¢.	.....15¢
A quality, White, 35¢.	.....15¢
B quality, Drab, 35¢.	.....15¢
B quality, White, 30¢.	.....15¢
Italian Hemp, 40¢.	.....15¢
Linen, 37¢.	.....15¢

**Wire, Picture—**

85¢ @ 85¢10¢

Note.—There is a good deal of confusion

in lists, some using old list and others the

new list.

**Corn Knives and Cutters**

See Knives, Corn.

**Corn Planters—**

See Planters, Corn.

**Crackers, Nut—**Little Giant.

.....\$ gr. \$34.00

**Cradles—**

Grain.

.....50¢

**Crayons—**

White Round Crayons, gross.

.....5¢ @ 6¢

Cases, 100 gro., \$4.50, at factory.

D. M. Steward Mfg. Co.

Metal Workers' Crayons, gr.

.....\$2.50

Soapstone Pencils, round, flat

or square.

.....\$1.50

Rolling Mill Crayons.

.....\$1.50

Railroad Crayons (compe-

sition) gr. \$2.00

See also Chalk.

**Creamery Pails—See Pails,**

Creamery.

**Crooks, Shepherds—**

Fort Madison, Heavy.

.....\$7.00

Fort Madison, Light.

.....\$6.50

**Crow Bars—See Bars, Crow.**

**Cultivators—**

Victor Garden.

.....\$10.00

**Cutlery Table—**

"Gross Goods," list Jan. '01, net.

.....\$5

Returns 10¢ to purchasers of \$250 worth in

six months.

**Cutters—Glass—**

Smith & Henshaw Co.

.....90¢

**Meat—**

Hale's, Nos. 11 & 11 1/2	13 & 13 1/2	15 & 15 1/2	18 & 18 1/2
Per doz.	\$10.30	12.30	18.00
American.	.....1	2	3
Nos.	.....\$5	\$7	\$10
Connecticut.	.....\$5	\$7	\$10

**Meat—**

Each.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Each.	.....\$1.75	2.25	3.00	3.00	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50

**Enterprise.**

Nos. 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20.

Each.

.....\$3

Dixon's.

.....\$3

Nos. 1.

.....\$14.00

Home No. 1.

.....\$22.75

Little Giant.

.....\$22.75

Nos. 305

.....\$10

Sterling.

.....\$35

Nos. 1

.....\$1

New Triumph No. 605.

.....\$24.00

Woodruff's.

.....\$15.00

Chadborn's Smoked Beef Cutter.

.....\$60.00

Enterprise Beef Shavers.

.....\$25.00

**Saw and Kraut—**

Henry Dixon & Sons:

Slaw, Corn Grater, &c.

.....\$40

Kraut Cutters 24 x 7, 26 x 8, 30 x 9, 35 x

Kraut Cutters 36 x 12, 40 x 12.

.....\$40

Tucker & Dorsey Mfg. Co.:

Kraut Cutters.

.....\$40

Slaw Cutters, 1 Knife, 2 gr.

.....\$15



Wire, Brown & Sharpe's.....25¢  
Wire, Morse's.....35¢  
Wire, P. & W. Co.....10¢10¢25¢

**Gimlets—**

Nail, Metal, Assorted, gro. \$1.50@1.75  
Spikes, Metal, Assorted, gro. \$3.00@3.50  
Nail, Wood Handled, Assorted, gro. \$4.00@4.25  
Spikes, Wood Handled, Assorted, gro. \$5.00@5.25

**Glass, American Window**

Jobbers' List, Sept. 1, 1900.

Less than Carloads.....85¢  
Carloads.....35¢10¢25¢

**Glue—Liquid, Fish—**

List A, Bottles or Cans, with Brush.....75¢@50¢  
List B, Cans (½ pts., pts., qts.).....35¢@15¢

List C, Cans (½ gal., gal.).....35¢@15¢

**Glue Pots—See Pots, Glue.****Grease, Axle—**

Common Grade.....gro. \$5.00@6.00  
Dixon's Everlasting.....10¢ pail, ea. 85¢  
Dixon's Everlasting, in box, 5 gal. 1 lb. \$1.90; 2 lb. \$2.00

Snow Flake:  
1 qt. cans, per doz. \$2.00; 5 gal. \$10.00  
1 gal. cans, per doz. \$4.00; 5 gal. \$20.00

**Grindstones—**

Pike Mfg. Co.:  
Improved Family Grindstones, per in. \$2.00  
Pike Mower Knife and Tool Grinder, each.....\$5.00

**Guards, Snow—**

Cleveland Wire Spring Co.:  
Galv. Steel 1000.....\$4.00  
Copper 1000.....\$18.00

**Gun Powder—See Powder.****Hack Saws—See Saws.****Hatts, Awl—**

Peg Patent, Leather Top.....\$4.50@5.25  
Peg Patent, Plain Top.....\$5.50@5.75

Sewing, Brass Ferrule.....\$1.50@1.60  
Saddlers', Brass Ferrule.....\$1.55@1.65  
Peg, Common.....\$1.85@1.95  
Brad, Common.....\$1.50@1.75

**Halters and Ties—**

Covert Mfg. Co., Web.....45¢25¢  
Covert Mfg. Co., Sinal Rope.....30¢25¢  
Covert's Saddlery Works, 90 List, Web.....60¢10¢  
Covert's Saddlery Works, Leather 60¢10¢  
Covert's Saddlery Works, Sinal.....60¢25¢  
Covert's Saddlery Works, Manila.....60¢25¢  
Covert's Saddlery Works, Cotton.....70¢

**Hammers—**

Handled Hammers—  
Heller's Machinists'.....50¢50¢55¢  
Heller's Farmers'.....50¢50¢55¢  
Magnetic Tack, No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

**Handled Hammers—**

Heller's Machinists'.....50¢50¢55¢  
Heller's Farmers'.....50¢50¢55¢  
Magnetic Tack, No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

**Handled Hammers—**

Heller's Machinists'.....50¢50¢55¢  
Heller's Farmers'.....50¢50¢55¢  
Magnetic Tack, No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132,

**Ladies—Melting—**

L. & O. Mfg. Co. .... 60%  
P. S. & W. .... 40@40%  
Reading ..... 50@10%  
Sargent's ..... 40@40%  
Sargent's ..... 40@40%

**Lanterns—Tubular—**

Regular Tubular ..... doz. \$4.50@5.50  
Side Lift Tubular ..... doz. \$4.75@5.25  
Square Lift Tubular ..... doz. \$4.75@5.25  
Other Styles ..... 10@10@10@5%

**Bull's Eye Police—**

No. 1, 3 1/4 inch ..... \$3.00  
No. 2, 3 inch ..... \$4.00

**Latches, Thumb—**

Roggin's Latches ..... doz. \$2@3.50

**Lawn Mowers—**

See Mowers, Lawn.

**Leaders, Cattle—**

Small ..... doz. 50c; large, 55c  
Covert Mfg. Co. .... 45@5%

**Lemon Squeezers—**

See Squeezers, Lemon.

**Lifters, Transom—**

Solid Grip, Payson Mfg. Co. .... 80%  
R. & E. .... 45%

**Lines—**

Wire Clothes, Nos. 18 19 20  
100 feet ..... \$2.20 2.00 1.65  
75 feet ..... \$1.50 1.70 1.30

Cassan Mills.  
Crown Solid Braided Chalk ..... 33%  
Mason's, No. 0 to No. 5 ..... 33%  
Samson Cordage Works:  
Solid Braided Chalk, No. 0 to 5 ..... 10%  
Silver Lake Braided Chalk, No. 0, \$6.00;  
No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50;  
No. 4, \$8.00; No. 5, \$8.50;  
No. 6, \$9.00; No. 7, \$9.50;  
No. 8, \$10.00; No. 9, \$10.50;  
No. 10, \$11.00; No. 11, \$11.50;  
No. 12, \$12.00; No. 13, \$12.50;  
No. 14, \$13.00; No. 15, \$13.50;  
No. 16, \$14.00; No. 17, \$14.50;  
No. 18, \$15.00; No. 19, \$15.50;  
No. 20, \$16.00; No. 21, \$16.50;  
No. 22, \$17.00; No. 23, \$17.50;  
No. 24, \$18.00; No. 25, \$18.50;  
No. 26, \$19.00; No. 27, \$19.50;  
No. 28, \$20.00; No. 29, \$20.50;  
No. 30, \$21.00; No. 31, \$21.50;  
No. 32, \$22.00; No. 33, \$22.50;  
No. 34, \$23.00; No. 35, \$23.50;  
No. 36, \$24.00; No. 37, \$24.50;  
No. 38, \$25.00; No. 39, \$25.50;  
No. 40, \$26.00; No. 41, \$26.50;  
No. 42, \$27.00; No. 43, \$27.50;  
No. 44, \$28.00; No. 45, \$28.50;  
No. 46, \$29.00; No. 47, \$29.50;  
No. 48, \$30.00; No. 49, \$30.50;  
No. 50, \$31.00; No. 51, \$31.50;  
No. 52, \$32.00; No. 53, \$32.50;  
No. 54, \$33.00; No. 55, \$33.50;  
No. 56, \$34.00; No. 57, \$34.50;  
No. 58, \$35.00; No. 59, \$35.50;  
No. 60, \$36.00; No. 61, \$36.50;  
No. 62, \$37.00; No. 63, \$37.50;  
No. 64, \$38.00; No. 65, \$38.50;  
No. 66, \$39.00; No. 67, \$39.50;  
No. 68, \$40.00; No. 69, \$40.50;  
No. 70, \$41.00; No. 71, \$41.50;  
No. 72, \$42.00; No. 73, \$42.50;  
No. 74, \$43.00; No. 75, \$43.50;  
No. 76, \$44.00; No. 77, \$44.50;  
No. 78, \$45.00; No. 79, \$45.50;  
No. 80, \$46.00; No. 81, \$46.50;  
No. 82, \$47.00; No. 83, \$47.50;  
No. 84, \$48.00; No. 85, \$48.50;  
No. 86, \$49.00; No. 87, \$49.50;  
No. 88, \$50.00; No. 89, \$50.50;  
No. 90, \$51.00; No. 91, \$51.50;  
No. 92, \$52.00; No. 93, \$52.50;  
No. 94, \$53.00; No. 95, \$53.50;  
No. 96, \$54.00; No. 97, \$54.50;  
No. 98, \$55.00; No. 99, \$55.50;  
No. 100, \$56.00; No. 101, \$56.50;  
No. 102, \$57.00; No. 103, \$57.50;  
No. 104, \$58.00; No. 105, \$58.50;  
No. 106, \$59.00; No. 107, \$59.50;  
No. 108, \$60.00; No. 109, \$60.50;  
No. 110, \$61.00; No. 111, \$61.50;  
No. 112, \$62.00; No. 113, \$62.50;  
No. 114, \$63.00; No. 115, \$63.50;  
No. 116, \$64.00; No. 117, \$64.50;  
No. 118, \$65.00; No. 119, \$65.50;  
No. 120, \$66.00; No. 121, \$66.50;  
No. 122, \$67.00; No. 123, \$67.50;  
No. 124, \$68.00; No. 125, \$68.50;  
No. 126, \$69.00; No. 127, \$69.50;  
No. 128, \$70.00; No. 129, \$70.50;  
No. 130, \$71.00; No. 131, \$71.50;  
No. 132, \$72.00; No. 133, \$72.50;  
No. 134, \$73.00; No. 135, \$73.50;  
No. 136, \$74.00; No. 137, \$74.50;  
No. 138, \$75.00; No. 139, \$75.50;  
No. 140, \$76.00; No. 141, \$76.50;  
No. 142, \$77.00; No. 143, \$77.50;  
No. 144, \$78.00; No. 145, \$78.50;  
No. 146, \$79.00; No. 147, \$79.50;  
No. 148, \$80.00; No. 149, \$80.50;  
No. 150, \$81.00; No. 151, \$81.50;  
No. 152, \$82.00; No. 153, \$82.50;  
No. 154, \$83.00; No. 155, \$83.50;  
No. 156, \$84.00; No. 157, \$84.50;  
No. 158, \$85.00; No. 159, \$85.50;  
No. 160, \$86.00; No. 161, \$86.50;  
No. 162, \$87.00; No. 163, \$87.50;  
No. 164, \$88.00; No. 165, \$88.50;  
No. 166, \$89.00; No. 167, \$89.50;  
No. 168, \$90.00; No. 169, \$90.50;  
No. 170, \$91.00; No. 171, \$91.50;  
No. 172, \$92.00; No. 173, \$92.50;  
No. 174, \$93.00; No. 175, \$93.50;  
No. 176, \$94.00; No. 177, \$94.50;  
No. 178, \$95.00; No. 179, \$95.50;  
No. 180, \$96.00; No. 181, \$96.50;  
No. 182, \$97.00; No. 183, \$97.50;  
No. 184, \$98.00; No. 185, \$98.50;  
No. 186, \$99.00; No. 187, \$99.50;  
No. 188, \$100.00; No. 189, \$100.50;  
No. 190, \$101.00; No. 191, \$101.50;  
No. 192, \$102.00; No. 193, \$102.50;  
No. 194, \$103.00; No. 195, \$103.50;  
No. 196, \$104.00; No. 197, \$104.50;  
No. 198, \$105.00; No. 199, \$105.50;  
No. 200, \$106.00; No. 201, \$106.50;  
No. 202, \$107.00; No. 203, \$107.50;  
No. 204, \$108.00; No. 205, \$108.50;  
No. 206, \$109.00; No. 207, \$109.50;  
No. 208, \$110.00; No. 209, \$110.50;  
No. 210, \$111.00; No. 211, \$111.50;  
No. 212, \$112.00; No. 213, \$112.50;  
No. 214, \$113.00; No. 215, \$113.50;  
No. 216, \$114.00; No. 217, \$114.50;  
No. 218, \$115.00; No. 219, \$115.50;  
No. 220, \$116.00; No. 221, \$116.50;  
No. 222, \$117.00; No. 223, \$117.50;  
No. 224, \$118.00; No. 225, \$118.50;  
No. 226, \$119.00; No. 227, \$119.50;  
No. 228, \$120.00; No. 229, \$120.50;  
No. 230, \$121.00; No. 231, \$121.50;  
No. 232, \$122.00; No. 233, \$122.50;  
No. 234, \$123.00; No. 235, \$123.50;  
No. 236, \$124.00; No. 237, \$124.50;  
No. 238, \$125.00; No. 239, \$125.50;  
No. 240, \$126.00; No. 241, \$126.50;  
No. 242, \$127.00; No. 243, \$127.50;  
No. 244, \$128.00; No. 245, \$128.50;  
No. 246, \$129.00; No. 247, \$129.50;  
No. 248, \$130.00; No. 249, \$130.50;  
No. 250, \$131.00; No. 251, \$131.50;  
No. 252, \$132.00; No. 253, \$132.50;  
No. 254, \$133.00; No. 255, \$133.50;  
No. 256, \$134.00; No. 257, \$134.50;  
No. 258, \$135.00; No. 259, \$135.50;  
No. 260, \$136.00; No. 261, \$136.50;  
No. 262, \$137.00; No. 263, \$137.50;  
No. 264, \$138.00; No. 265, \$138.50;  
No. 266, \$139.00; No. 267, \$139.50;  
No. 268, \$140.00; No. 269, \$140.50;  
No. 270, \$141.00; No. 271, \$141.50;  
No. 272, \$142.00; No. 273, \$142.50;  
No. 274, \$143.00; No. 275, \$143.50;  
No. 276, \$144.00; No. 277, \$144.50;  
No. 278, \$145.00; No. 279, \$145.50;  
No. 280, \$146.00; No. 281, \$146.50;  
No. 282, \$147.00; No. 283, \$147.50;  
No. 284, \$148.00; No. 285, \$148.50;  
No. 286, \$149.00; No. 287, \$149.50;  
No. 288, \$150.00; No. 289, \$150.50;  
No. 290, \$151.00; No. 291, \$151.50;  
No. 292, \$152.00; No. 293, \$152.50;  
No. 294, \$153.00; No. 295, \$153.50;  
No. 296, \$154.00; No. 297, \$154.50;  
No. 298, \$155.00; No. 299, \$155.50;  
No. 300, \$156.00; No. 301, \$156.50;  
No. 302, \$157.00; No. 303, \$157.50;  
No. 304, \$158.00; No. 305, \$158.50;  
No. 306, \$159.00; No. 307, \$159.50;  
No. 308, \$160.00; No. 309, \$160.50;  
No. 310, \$161.00; No. 311, \$161.50;  
No. 312, \$162.00; No. 313, \$162.50;  
No. 314, \$163.00; No. 315, \$163.50;  
No. 316, \$164.00; No. 317, \$164.50;  
No. 318, \$165.00; No. 319, \$165.50;  
No. 320, \$166.00; No. 321, \$166.50;  
No. 322, \$167.00; No. 323, \$167.50;  
No. 324, \$168.00; No. 325, \$168.50;  
No. 326, \$169.00; No. 327, \$169.50;  
No. 328, \$170.00; No. 329, \$170.50;  
No. 330, \$171.00; No. 331, \$171.50;  
No. 332, \$172.00; No. 333, \$172.50;  
No. 334, \$173.00; No. 335, \$173.50;  
No. 336, \$174.00; No. 337, \$174.50;  
No. 338, \$175.00; No. 339, \$175.50;  
No. 340, \$176.00; No. 341, \$176.50;  
No. 342, \$177.00; No. 343, \$177.50;  
No. 344, \$178.00; No. 345, \$178.50;  
No. 346, \$179.00; No. 347, \$179.50;  
No. 348, \$180.00; No. 349, \$180.50;  
No. 350, \$181.00; No. 351, \$181.50;  
No. 352, \$182.00; No. 353, \$182.50;  
No. 354, \$183.00; No. 355, \$183.50;  
No. 356, \$184.00; No. 357, \$184.50;  
No. 358, \$185.00; No. 359, \$185.50;  
No. 360, \$186.00; No. 361, \$186.50;  
No. 362, \$187.00; No. 363, \$187.50;  
No. 364, \$188.00; No. 365, \$188.50;  
No. 366, \$189.00; No. 367, \$189.50;  
No. 368, \$190.00; No. 369, \$190.50;  
No. 370, \$191.00; No. 371, \$191.50;  
No. 372, \$192.00; No. 373, \$192.50;  
No. 374, \$193.00; No. 375, \$193.50;  
No. 376, \$194.00; No. 377, \$194.50;  
No. 378, \$195.00; No. 379, \$195.50;  
No. 380, \$196.00; No. 381, \$196.50;  
No. 382, \$197.00; No. 383, \$197.50;  
No. 384, \$198.00; No. 385, \$198.50;  
No. 386, \$199.00; No. 387, \$199.50;  
No. 388, \$200.00; No. 389, \$200.50;  
No. 390, \$201.00; No. 391, \$201.50;  
No. 392, \$202.00; No. 393, \$202.50;  
No. 394, \$203.00; No. 395, \$203.50;  
No. 396, \$204.00; No. 397, \$204.50;  
No. 398, \$205.00; No. 399, \$205.50;  
No. 400, \$206.00; No. 401, \$206.50;  
No. 402, \$207.00; No. 403, \$207.50;  
No. 404, \$208.00; No. 405, \$208.50;  
No. 406, \$209.00; No. 407, \$209.50;  
No. 408, \$210.00; No. 409, \$210.50;  
No. 410, \$211.00; No. 411, \$211.50;  
No. 412, \$212.00; No. 413, \$212.50;  
No. 414, \$213.00; No. 415, \$213.50;  
No. 416, \$214.00; No. 417, \$214.50;  
No. 418, \$215.00; No. 419, \$215.50;  
No. 420, \$216.00; No. 421, \$216.50;  
No. 422, \$217.00; No. 423, \$217.50;  
No. 424, \$218.00; No. 425, \$218.50;  
No. 426, \$219.00; No. 427, \$219.50;  
No. 428, \$220.00; No. 429, \$220.50;  
No. 430, \$221.00; No. 431, \$221.50;  
No. 432, \$222.00; No. 433, \$222.50;  
No. 434, \$223.00; No. 435, \$223.50;  
No. 436, \$224.00; No. 437, \$224.50;  
No. 438, \$225.00; No. 439, \$225.50;  
No. 440, \$226.00; No. 441, \$226.50;  
No. 442, \$227.00; No. 443, \$227.50;  
No. 444, \$228.00; No. 445, \$228.50;  
No. 446, \$229.00; No. 447, \$229.50;  
No. 448, \$230.00; No. 449, \$230.50;  
No. 450, \$231.00; No. 451, \$231.50;  
No. 452, \$232.00; No. 453, \$232.50;  
No. 454, \$233.00; No. 455, \$233.50;  
No. 456, \$234.00; No. 457, \$234.50;  
No. 458, \$235.00; No. 459, \$235.50;  
No. 460, \$236.00; No. 461, \$236.50;  
No. 462, \$237.00; No. 463, \$237.50;  
No. 464, \$238.00; No. 465, \$238.50;  
No. 466, \$239.00; No. 467, \$239.50;  
No. 468, \$240.00; No. 469, \$240.50;  
No. 470, \$241.00; No. 471, \$241.50;  
No. 472, \$242.00; No. 473, \$242.50;  
No. 474, \$243.00; No. 475, \$243.50;  
No. 476, \$244.00; No. 477, \$244.50;  
No. 478, \$245.00; No. 479, \$245.50;  
No. 480, \$246.00; No. 481, \$246.50;  
No. 482, \$247.00; No. 483, \$247.50;  
No. 484, \$248.00; No. 485, \$248.50;  
No. 486, \$249.00; No. 487, \$249.50;  
No. 488, \$250.00; No. 489, \$250.50;  
No. 490, \$251.00; No. 491, \$251.50;  
No. 492, \$252.00; No. 493, \$252.50;  
No. 494, \$253.00; No. 495, \$253.50;  
No. 496, \$254.00; No. 497, \$254.50;  
No. 498, \$255.00; No. 499, \$255.50;  
No. 500, \$256.00; No. 501, \$256.50;  
No. 502, \$257.00; No. 503, \$257.50;  
No. 504, \$258.00; No. 505, \$258.50;  
No. 506, \$259.00; No. 507, \$259.50;  
No. 508, \$260.00; No. 509, \$260.50;  
No. 510, \$261.00; No. 511, \$261.50;  
No. 512, \$262.00; No. 513, \$262.50;  
No. 514, \$263.00; No. 515, \$263.50;  
No. 516, \$264.00; No. 517, \$264.50;  
No. 518, \$265.00; No. 519, \$265.50;  
No. 520, \$266.00; No. 521, \$266.50;  
No. 522, \$267.00; No. 523, \$267.50;  
No. 524, \$268.00; No. 525, \$268.50;  
No. 526, \$269.00; No. 527, \$269.50;  
No. 528, \$270.00; No. 529, \$270.50;  
No. 530, \$271.00; No. 531, \$271.50;  
No. 532, \$272.00; No. 533, \$272.50;  
No. 534, \$273.00; No. 535, \$273.50;  
No. 536, \$274.00; No. 537, \$274.50;  
No. 538, \$275.00; No. 539, \$275.50;  
No. 540, \$276.00; No. 541, \$276.50;  
No. 542, \$277.00; No. 543, \$277.50;  
No. 544, \$278.00; No. 545, \$278.50;  
No. 546, \$279.00; No. 547, \$279.50;  
No. 548, \$280.00; No. 549, \$280.50;  
No. 550, \$281.00; No. 551, \$281.50;  
No. 552, \$282.00; No. 553, \$282.50;  
No. 554, \$283.00; No. 555, \$283.50;  
No. 556, \$284.00; No. 557, \$284.50;  
No. 558, \$285.00; No. 559, \$285.50;  
No. 560, \$286.00; No. 561, \$286.50;  
No. 562, \$287.00; No. 563, \$287.50;  
No. 564, \$288.00; No. 565, \$288.50;  
No. 566, \$289.00; No. 567, \$289.50;  
No. 568, \$290.00; No. 569, \$290.50;  
No. 570, \$291.00; No. 571, \$291.50;  
No. 572, \$292.00; No. 573, \$292.50;  
No. 574, \$293.00; No. 575, \$293.50;  
No. 576, \$294.00; No. 577, \$294.50;  
No. 578, \$295.00; No. 579, \$295.50;  
No. 580, \$296.00; No. 581, \$296.50;  
No. 582, \$297.00; No. 583, \$297.50;  
No. 584, \$298.00; No. 585, \$298.50;  
No. 586, \$299.00; No. 587, \$299.50;  
No. 588, \$300.00; No. 589, \$300.50;  
No. 590, \$301.00; No. 591, \$301.50;  
No. 592, \$302.00; No. 593, \$302.50;  
No. 594, \$303.00; No. 595, \$303.50;  
No. 596, \$304.00; No. 597, \$304.50;  
No. 598, \$305.00; No. 599, \$305.50;  
No. 600, \$306.00; No. 601, \$306.50;  
No. 602, \$307.00; No. 603, \$307.50;  
No. 604, \$308.00; No. 605, \$308.50;  
No. 606, \$309.00; No. 607, \$309.50;  
No. 608, \$310.00; No. 609, \$310.50;  
No. 610, \$311.00; No. 611, \$311.50;  
No. 612, \$312.00; No. 613, \$312.50;  
No. 614, \$313.00; No. 615, \$313.50;  
No. 616, \$314.00; No. 617, \$314.50;  
No. 618, \$315.00; No. 619, \$315.50;  
No. 620, \$316.00; No. 621, \$316.50;  
No. 622, \$317.00; No. 623, \$317.50;  
No. 624, \$318.00; No. 625, \$318.50;  
No. 626, \$319.00; No. 627, \$319.50;  
No. 628, \$320.00; No. 629, \$320.50;  
No. 630, \$321.00; No. 631, \$321.50;  
No. 632, \$322.00; No. 633, \$322.50;  
No. 634, \$323.00; No. 635, \$323.50;  
No. 636, \$324.00; No. 637, \$324.50;  
No. 638, \$325.00; No. 639, \$325.50;  
No. 640, \$326.00; No. 641, \$326.50;  
No. 642, \$327.00; No. 643, \$327.50;  
No. 644, \$328.00; No. 645, \$328.50;  
No. 646, \$329.00; No. 647, \$329.50;  
No. 648, \$330.00; No. 649, \$330.50;  
No. 650, \$331.00; No. 651, \$331.50;  
No. 652, \$332.00; No. 653, \$332.50;  
No. 654, \$333.00; No. 655, \$333.50;  
No. 656, \$334.00; No. 657, \$334.50;  
No. 658, \$335.00; No. 659, \$335.50;  
No. 660, \$336.00; No. 661, \$336.50;  
No. 662, \$337.00; No. 663, \$337.50;  
No. 664, \$338.00; No. 665, \$338.50;  
No. 666, \$339.00; No. 667, \$339.50;  
No. 668, \$340.00; No. 669, \$340.50;  
No. 670, \$341.00; No. 671, \$341.50;  
No. 672, \$342.00; No. 673, \$342.50;  
No. 674, \$343.00; No. 675, \$343.50;  
No. 676, \$344.00; No. 677, \$344.50;  
No. 678, \$345.00; No. 679, \$345.50;  
No. 680, \$346.00; No. 681, \$346.50;  
No. 682, \$347.00; No. 683, \$347.50;  
No. 684, \$348.00; No. 685, \$348.50;  
No. 686, \$349.00; No. 687, \$349.50;  
No. 688, \$350.00; No. 689, \$350.50;  
No. 690, \$351.00; No. 691, \$351.50;  
No. 692, \$352.00; No. 693, \$352.50;  
No. 694, \$353.00; No. 695, \$353.50;  
No. 696, \$354.00; No. 697, \$354.50;  
No. 698, \$355.00; No. 699, \$355.50;  
No. 700, \$356.00; No. 701, \$356.50;  
No. 702, \$357.00; No. 703, \$357.50;  
No. 704, \$358.00; No. 705, \$358.50;  
No. 706, \$359.00; No. 707, \$359.50;  
No. 708, \$360.00; No. 709, \$360.50;  
No. 710, \$361.00; No. 711, \$361.50;  
No. 712, \$362.00; No. 713, \$362.50;  
No. 714, \$363.00; No. 715, \$363.50;  
No.



Hay Fork, Stowell's Anti-Friction, 5-in. Wheel, \$12.00..... 40%  
Hot House, Awning, etc..... 60@60&10%  
Japanned Clothes Line..... 60@60&10%  
Japanned Screw..... 70&10&10%  
Japanned Side..... 70&10&10%  
Stowell's Ceiling or End, Anti-Friction 60%  
Stowell's Dumb Walter, Anti-Friction..... 60&10%  
Stowell's Electric Light..... 60%  
Stowell's Slide, Anti-Friction..... 60&10%

**Sash Pulleys—**  
Acme..... 14 in. 16; 2 in. 19  
Common Sense, 14 in. 16; 2 in. 18;  
3 in. 20.

Fox-All-Steel, Nos. 3 and 7, 2 1/2 in. 19;  
No. 9, 1 1/2 in. 19;  
Extra for Plated Finish..... 20%  
Extra for Anti-Friction..... 20%  
Bushings..... 20%  
Grand Rapids All Steel Noiseless..... 40%  
Ideal No. 13..... 14 in. 16; 2 in. 19;  
Niagara..... 14 in. 16; 2 in. 19;  
No. 26, Troy..... 14 in. 16; 2 in. 19;  
Star..... 14 in. 16; 2 in. 19;  
Tackle Blocks—See Blocks.

**Pumps—**  
Cast Iron..... 60@60&10%  
Pitcher Spout..... 75&65@75&10%  
Pump Leathers, all sizes..... 30-60%  
Barnes Dbl. Acting (low list)..... 35%  
Flint & Walling's Fast Mail..... 55&55&10%  
Flint & Walling's Pitcher Spout..... 55&55%  
Loud's Suction Pump, U. S. Co..... 50%  
Myer's Pumps, low list..... 50%  
Contractors' Rubber Diaphragm Non-chokable, B. & L. Block Co..... 20%

**Punches—**  
Revolving (4 tubes)..... 35.75@4.00  
Saddlers' or Drive, good..... 65@70%  
Spring, good quality..... 1.65@1.75  
Bemis & Call Co.'s Cast Steel Drive..... 50%  
Bemis & Call Co.'s Check..... 55%  
Bemis & Call Co.'s Spring..... 55%  
Niagara Hollow Punches..... 45%  
Niagara Solid Punches..... 55%  
Steel Screw, B. & K. Mfg. Co..... 40%  
Tinnars' Hollow, P. S. & W. Co..... 35&3&5%  
Tinnars' Solid, P. S. & W. Co..... 35%  
R. 44..... 35%

**Rail—Barn Door, &c.—**  
Barn Door, Light, 1/2 in. 1/2 1/2 1/2 1/2  
100 feet..... \$2.00 \$2.50 \$3.00  
B. D. for N. E. Hangers:  
Small, Med. Large.  
100 feet..... \$1.20 \$2.70 \$3.20  
Sliding Door, Bronzed Wrt Iron..... 11.65@12.00

Sliding Door, Iron Painted..... 11.65@12.00  
Sliding Door, Wrought Brass, 1/4 in. 1/2 in. 3/4 in. 1 in. 1 1/2 in. 2 in. 2 1/2 in. 3 in. 3 1/2 in. 4 in. 4 1/2 in. 5 in. 5 1/2 in. 6 in. 6 1/2 in. 7 in. 7 1/2 in. 8 in. 8 1/2 in. 9 in. 9 1/2 in. 10 in. 10 1/2 in. 11 in. 11 1/2 in. 12 in. 12 1/2 in. 13 in. 13 1/2 in. 14 in. 14 1/2 in. 15 in. 15 1/2 in. 16 in. 16 1/2 in. 17 in. 17 1/2 in. 18 in. 18 1/2 in. 19 in. 19 1/2 in. 20 in. 20 1/2 in. 21 in. 21 1/2 in. 22 in. 22 1/2 in. 23 in. 23 1/2 in. 24 in. 24 1/2 in. 25 in. 25 1/2 in. 26 in. 26 1/2 in. 27 in. 27 1/2 in. 28 in. 28 1/2 in. 29 in. 29 1/2 in. 30 in. 30 1/2 in. 31 in. 31 1/2 in. 32 in. 32 1/2 in. 33 in. 33 1/2 in. 34 in. 34 1/2 in. 35 in. 35 1/2 in. 36 in. 36 1/2 in. 37 in. 37 1/2 in. 38 in. 38 1/2 in. 39 in. 39 1/2 in. 40 in. 40 1/2 in. 41 in. 41 1/2 in. 42 in. 42 1/2 in. 43 in. 43 1/2 in. 44 in. 44 1/2 in. 45 in. 45 1/2 in. 46 in. 46 1/2 in. 47 in. 47 1/2 in. 48 in. 48 1/2 in. 49 in. 49 1/2 in. 50 in. 50 1/2 in. 51 in. 51 1/2 in. 52 in. 52 1/2 in. 53 in. 53 1/2 in. 54 in. 54 1/2 in. 55 in. 55 1/2 in. 56 in. 56 1/2 in. 57 in. 57 1/2 in. 58 in. 58 1/2 in. 59 in. 59 1/2 in. 60 in. 60 1/2 in. 61 in. 61 1/2 in. 62 in. 62 1/2 in. 63 in. 63 1/2 in. 64 in. 64 1/2 in. 65 in. 65 1/2 in. 66 in. 66 1/2 in. 67 in. 67 1/2 in. 68 in. 68 1/2 in. 69 in. 69 1/2 in. 70 in. 70 1/2 in. 71 in. 71 1/2 in. 72 in. 72 1/2 in. 73 in. 73 1/2 in. 74 in. 74 1/2 in. 75 in. 75 1/2 in. 76 in. 76 1/2 in. 77 in. 77 1/2 in. 78 in. 78 1/2 in. 79 in. 79 1/2 in. 80 in. 80 1/2 in. 81 in. 81 1/2 in. 82 in. 82 1/2 in. 83 in. 83 1/2 in. 84 in. 84 1/2 in. 85 in. 85 1/2 in. 86 in. 86 1/2 in. 87 in. 87 1/2 in. 88 in. 88 1/2 in. 89 in. 89 1/2 in. 90 in. 90 1/2 in. 91 in. 91 1/2 in. 92 in. 92 1/2 in. 93 in. 93 1/2 in. 94 in. 94 1/2 in. 95 in. 95 1/2 in. 96 in. 96 1/2 in. 97 in. 97 1/2 in. 98 in. 98 1/2 in. 99 in. 99 1/2 in. 100 in. 100 1/2 in. 101 in. 101 1/2 in. 102 in. 102 1/2 in. 103 in. 103 1/2 in. 104 in. 104 1/2 in. 105 in. 105 1/2 in. 106 in. 106 1/2 in. 107 in. 107 1/2 in. 108 in. 108 1/2 in. 109 in. 109 1/2 in. 110 in. 110 1/2 in. 111 in. 111 1/2 in. 112 in. 112 1/2 in. 113 in. 113 1/2 in. 114 in. 114 1/2 in. 115 in. 115 1/2 in. 116 in. 116 1/2 in. 117 in. 117 1/2 in. 118 in. 118 1/2 in. 119 in. 119 1/2 in. 120 in. 120 1/2 in. 121 in. 121 1/2 in. 122 in. 122 1/2 in. 123 in. 123 1/2 in. 124 in. 124 1/2 in. 125 in. 125 1/2 in. 126 in. 126 1/2 in. 127 in. 127 1/2 in. 128 in. 128 1/2 in. 129 in. 129 1/2 in. 130 in. 130 1/2 in. 131 in. 131 1/2 in. 132 in. 132 1/2 in. 133 in. 133 1/2 in. 134 in. 134 1/2 in. 135 in. 135 1/2 in. 136 in. 136 1/2 in. 137 in. 137 1/2 in. 138 in. 138 1/2 in. 139 in. 139 1/2 in. 140 in. 140 1/2 in. 141 in. 141 1/2 in. 142 in. 142 1/2 in. 143 in. 143 1/2 in. 144 in. 144 1/2 in. 145 in. 145 1/2 in. 146 in. 146 1/2 in. 147 in. 147 1/2 in. 148 in. 148 1/2 in. 149 in. 149 1/2 in. 150 in. 150 1/2 in. 151 in. 151 1/2 in. 152 in. 152 1/2 in. 153 in. 153 1/2 in. 154 in. 154 1/2 in. 155 in. 155 1/2 in. 156 in. 156 1/2 in. 157 in. 157 1/2 in. 158 in. 158 1/2 in. 159 in. 159 1/2 in. 160 in. 160 1/2 in. 161 in. 161 1/2 in. 162 in. 162 1/2 in. 163 in. 163 1/2 in. 164 in. 164 1/2 in. 165 in. 165 1/2 in. 166 in. 166 1/2 in. 167 in. 167 1/2 in. 168 in. 168 1/2 in. 169 in. 169 1/2 in. 170 in. 170 1/2 in. 171 in. 171 1/2 in. 172 in. 172 1/2 in. 173 in. 173 1/2 in. 174 in. 174 1/2 in. 175 in. 175 1/2 in. 176 in. 176 1/2 in. 177 in. 177 1/2 in. 178 in. 178 1/2 in. 179 in. 179 1/2 in. 180 in. 180 1/2 in. 181 in. 181 1/2 in. 182 in. 182 1/2 in. 183 in. 183 1/2 in. 184 in. 184 1/2 in. 185 in. 185 1/2 in. 186 in. 186 1/2 in. 187 in. 187 1/2 in. 188 in. 188 1/2 in. 189 in. 189 1/2 in. 190 in. 190 1/2 in. 191 in. 191 1/2 in. 192 in. 192 1/2 in. 193 in. 193 1/2 in. 194 in. 194 1/2 in. 195 in. 195 1/2 in. 196 in. 196 1/2 in. 197 in. 197 1/2 in. 198 in. 198 1/2 in. 199 in. 199 1/2 in. 200 in. 200 1/2 in. 201 in. 201 1/2 in. 202 in. 202 1/2 in. 203 in. 203 1/2 in. 204 in. 204 1/2 in. 205 in. 205 1/2 in. 206 in. 206 1/2 in. 207 in. 207 1/2 in. 208 in. 208 1/2 in. 209 in. 209 1/2 in. 210 in. 210 1/2 in. 211 in. 211 1/2 in. 212 in. 212 1/2 in. 213 in. 213 1/2 in. 214 in. 214 1/2 in. 215 in. 215 1/2 in. 216 in. 216 1/2 in. 217 in. 217 1/2 in. 218 in. 218 1/2 in. 219 in. 219 1/2 in. 220 in. 220 1/2 in. 221 in. 221 1/2 in. 222 in. 222 1/2 in. 223 in. 223 1/2 in. 224 in. 224 1/2 in. 225 in. 225 1/2 in. 226 in. 226 1/2 in. 227 in. 227 1/2 in. 228 in. 228 1/2 in. 229 in. 229 1/2 in. 230 in. 230 1/2 in. 231 in. 231 1/2 in. 232 in. 232 1/2 in. 233 in. 233 1/2 in. 234 in. 234 1/2 in. 235 in. 235 1/2 in. 236 in. 236 1/2 in. 237 in. 237 1/2 in. 238 in. 238 1/2 in. 239 in. 239 1/2 in. 240 in. 240 1/2 in. 241 in. 241 1/2 in. 242 in. 242 1/2 in. 243 in. 243 1/2 in. 244 in. 244 1/2 in. 245 in. 245 1/2 in. 246 in. 246 1/2 in. 247 in. 247 1/2 in. 248 in. 248 1/2 in. 249 in. 249 1/2 in. 250 in. 250 1/2 in. 251 in. 251 1/2 in. 252 in. 252 1/2 in. 253 in. 253 1/2 in. 254 in. 254 1/2 in. 255 in. 255 1/2 in. 256 in. 256 1/2 in. 257 in. 257 1/2 in. 258 in. 258 1/2 in. 259 in. 259 1/2 in. 260 in. 260 1/2 in. 261 in. 261 1/2 in. 262 in. 262 1/2 in. 263 in. 263 1/2 in. 264 in. 264 1/2 in. 265 in. 265 1/2 in. 266 in. 266 1/2 in. 267 in. 267 1/2 in. 268 in. 268 1/2 in. 269 in. 269 1/2 in. 270 in. 270 1/2 in. 271 in. 271 1/2 in. 272 in. 272 1/2 in. 273 in. 273 1/2 in. 274 in. 274 1/2 in. 275 in. 275 1/2 in. 276 in. 276 1/2 in. 277 in. 277 1/2 in. 278 in. 278 1/2 in. 279 in. 279 1/2 in. 280 in. 280 1/2 in. 281 in. 281 1/2 in. 282 in. 282 1/2 in. 283 in. 283 1/2 in. 284 in. 284 1/2 in. 285 in. 285 1/2 in. 286 in. 286 1/2 in. 287 in. 287 1/2 in. 288 in. 288 1/2 in. 289 in. 289 1/2 in. 290 in. 290 1/2 in. 291 in. 291 1/2 in. 292 in. 292 1/2 in. 293 in. 293 1/2 in. 294 in. 294 1/2 in. 295 in. 295 1/2 in. 296 in. 296 1/2 in. 297 in. 297 1/2 in. 298 in. 298 1/2 in. 299 in. 299 1/2 in. 300 in. 300 1/2 in. 301 in. 301 1/2 in. 302 in. 302 1/2 in. 303 in. 303 1/2 in. 304 in. 304 1/2 in. 305 in. 305 1/2 in. 306 in. 306 1/2 in. 307 in. 307 1/2 in. 308 in. 308 1/2 in. 309 in. 309 1/2 in. 310 in. 310 1/2 in. 311 in. 311 1/2 in. 312 in. 312 1/2 in. 313 in. 313 1/2 in. 314 in. 314 1/2 in. 315 in. 315 1/2 in. 316 in. 316 1/2 in. 317 in. 317 1/2 in. 318 in. 318 1/2 in. 319 in. 319 1/2 in. 320 in. 320 1/2 in. 321 in. 321 1/2 in. 322 in. 322 1/2 in. 323 in. 323 1/2 in. 324 in. 324 1/2 in. 325 in. 325 1/2 in. 326 in. 326 1/2 in. 327 in. 327 1/2 in. 328 in. 328 1/2 in. 329 in. 329 1/2 in. 330 in. 330 1/2 in. 331 in. 331 1/2 in. 332 in. 332 1/2 in. 333 in. 333 1/2 in. 334 in. 334 1/2 in. 335 in. 335 1/2 in. 336 in. 336 1/2 in. 337 in. 337 1/2 in. 338 in. 338 1/2 in. 339 in. 339 1/2 in. 340 in. 340 1/2 in. 341 in. 341 1/2 in. 342 in. 342 1/2 in. 343 in. 343 1/2 in. 344 in. 344 1/2 in. 345 in. 345 1/2 in. 346 in. 346 1/2 in. 347 in. 347 1/2 in. 348 in. 348 1/2 in. 349 in. 349 1/2 in. 350 in. 350 1/2 in. 351 in. 351 1/2 in. 352 in. 352 1/2 in. 353 in. 353 1/2 in. 354 in. 354 1/2 in. 355 in. 355 1/2 in. 356 in. 356 1/2 in. 357 in. 357 1/2 in. 358 in. 358 1/2 in. 359 in. 359 1/2 in. 360 in. 360 1/2 in. 361 in. 361 1/2 in. 362 in. 362 1/2 in. 363 in. 363 1/2 in. 364 in. 364 1/2 in. 365 in. 365 1/2 in. 366 in. 366 1/2 in. 367 in. 367 1/2 in. 368 in. 368 1/2 in. 369 in. 369 1/2 in. 370 in. 370 1/2 in. 371 in. 371 1/2 in. 372 in. 372 1/2 in. 373 in. 373 1/2 in. 374 in. 374 1/2 in. 375 in. 375 1/2 in. 376 in. 376 1/2 in. 377 in. 377 1/2 in. 378 in. 378 1/2 in. 379 in. 379 1/2 in. 380 in. 380 1/2 in. 381 in. 381 1/2 in. 382 in. 382 1/2 in. 383 in. 383 1/2 in. 384 in. 384 1/2 in. 385 in. 385 1/2 in. 386 in. 386 1/2 in. 387 in. 387 1/2 in. 388 in. 388 1/2 in. 389 in. 389 1/2 in. 390 in. 390 1/2 in. 391 in. 391 1/2 in. 392 in. 392 1/2 in. 393 in. 393 1/2 in. 394 in. 394 1/2 in. 395 in. 395 1/2 in. 396 in. 396 1/2 in. 397 in. 397 1/2 in. 398 in. 398 1/2 in. 399 in. 399 1/2 in. 400 in. 400 1/2 in. 401 in. 401 1/2 in. 402 in. 402 1/2 in. 403 in. 403 1/2 in. 404 in. 404 1/2 in. 405 in. 405 1/2 in. 406 in. 406 1/2 in. 407 in. 407 1/2 in. 408 in. 408 1/2 in. 409 in. 409 1/2 in. 410 in. 410 1/2 in. 411 in. 411 1/2 in. 412 in. 412 1/2 in. 413 in. 413 1/2 in. 414 in. 414 1/2 in. 415 in. 415 1/2 in. 416 in. 416 1/2 in. 417 in. 417 1/2 in. 418 in. 418 1/2 in. 419 in. 419 1/2 in. 420 in. 420 1/2 in. 421 in. 421 1/2 in. 422 in. 422 1/2 in. 423 in. 423 1/2 in. 424 in. 424 1/2 in. 425 in. 425 1/2 in. 426 in. 426 1/2 in. 427 in. 427 1/2 in. 428 in. 428 1/2 in. 429 in. 429 1/2 in. 430 in. 430 1/2 in. 431 in. 431 1/2 in. 432 in. 432 1/2 in. 433 in. 433 1/2 in. 434 in. 434 1/2 in. 435 in. 435 1/2 in. 436 in. 436 1/2 in. 437 in. 437 1/2 in. 438 in. 438 1/2 in. 439 in. 439 1/2 in. 440 in. 440 1/2 in. 441 in. 441 1/2 in. 442 in. 442 1/2 in. 443 in. 443 1/2 in. 444 in. 444 1/2 in. 445 in. 445 1/2 in. 446 in. 446 1/2 in. 447 in. 447 1/2 in. 448 in. 448 1/2 in. 449 in. 449 1/2 in. 450 in. 450 1/2 in. 451 in. 451 1/2 in. 452 in. 452 1/2 in. 453 in. 453 1/2 in. 454 in. 454 1/2 in. 455 in. 455 1/2 in. 456 in. 456 1/2 in. 457 in. 457 1/2 in. 458 in. 458 1/2 in. 459 in. 459 1/2 in. 460 in. 460 1/2 in. 461 in. 461 1/2 in. 462 in. 462 1/2 in. 463 in. 463 1/2 in. 464 in. 464 1/2 in. 465 in. 465 1/2 in. 466 in. 466 1/2 in. 467 in. 467 1/2 in. 468 in. 468 1/2 in. 469 in. 469 1/2 in. 470 in. 470 1/2 in. 471 in. 471 1/2 in. 472 in. 472 1/2 in. 473 in. 473 1/2 in. 474 in. 474 1/2 in. 475 in. 475 1/2 in. 476 in. 476 1/2 in. 477 in. 477 1/2 in. 478 in. 478 1/2 in. 479 in. 479 1/2 in. 480 in. 480 1/2 in. 481 in. 481 1/2 in. 482 in. 482 1/2 in. 483 in. 483 1/2 in. 484 in. 484 1/2 in. 485 in. 485 1/2 in. 486 in. 486 1/2 in. 487 in. 487 1/2 in. 488 in. 488 1/2 in. 489 in. 489 1/2 in. 490 in. 490 1/2 in. 491 in. 491 1/2 in. 492 in. 492 1/2 in. 493 in. 493 1/2 in. 494 in. 494 1/2 in. 495 in. 495 1/2 in. 496 in. 496 1/2 in. 497 in. 497 1/2 in. 498 in. 498 1/2 in. 499 in. 499 1/2 in. 500 in. 500 1/2 in. 501 in. 501 1/2 in. 502 in. 502 1/2 in. 503 in. 503 1/2 in. 504 in. 504 1/2 in. 505 in. 505 1/2 in. 506 in. 506 1/2 in. 507 in. 507 1/2 in. 508 in. 508 1/2 in. 509 in. 509 1/2 in. 510 in. 510 1/2 in. 511 in. 511 1/2 in. 512 in. 512 1/2 in. 513 in. 513 1/2 in. 514 in. 514 1/2 in. 515 in. 515 1/2 in. 516 in. 516 1/2 in. 517 in. 517 1/2 in. 518 in. 518 1/2 in. 519 in. 519 1/2 in. 520 in. 520 1/2 in. 521 in. 521 1/2 in. 522 in. 522 1/2 in. 523 in. 523 1/2 in. 524 in. 524 1/2 in. 525 in. 525 1/2 in. 526 in. 526 1/2 in. 527 in. 527 1/2 in. 528 in. 528 1/2 in. 529 in. 529 1/2 in. 530 in. 530 1/2 in. 531 in. 531 1/2 in. 532 in. 532 1/2 in. 533 in. 533 1/2 in. 534 in. 534 1/2 in. 535 in. 535 1/2 in. 536 in. 536 1/2 in. 537 in. 537 1/2 in. 538 in. 538 1/2 in. 539 in. 539 1/2 in. 540 in. 540 1/2 in. 541 in. 541 1/2 in. 542 in. 542 1/2 in. 543 in. 543 1/2 in. 544 in. 544 1/2 in. 545 in. 545 1/2 in. 546 in. 546 1/2 in. 547 in. 547 1/2 in. 548 in. 548 1/2 in. 549 in. 549 1/2 in. 550 in. 550 1/2 in. 551 in. 551 1/2 in. 552 in. 552 1/2 in. 553 in. 553 1/2 in. 554 in. 554 1/2 in. 555 in. 555 1/2 in. 556 in. 556 1/2 in. 557 in. 557 1/2 in. 558 in. 558 1/2 in. 559 in. 559 1/2 in. 560 in. 560 1/2 in. 561 in. 561 1/2 in. 562 in. 562 1/2 in. 563 in. 563 1/2 in. 564 in. 564 1/2 in. 565 in. 565 1/2 in. 566 in. 566 1/2 in. 567 in. 567 1/2 in. 568 in. 568 1/2 in. 569 in. 569 1/2 in. 570 in. 570 1/2 in. 571 in. 571 1/2 in. 572 in. 572 1/2 in. 573 in. 573 1/2 in. 574 in. 574 1/2 in. 575 in. 575 1/2 in. 576 in. 576 1/2 in. 577 in. 577 1/2 in. 578 in. 578 1/2 in. 579 in. 579 1/2 in. 580 in. 580 1/2 in. 581 in. 581 1/2 in. 582 in. 582 1/2 in. 583 in. 583 1/2 in. 584 in. 584 1/2 in. 585 in. 585 1/2 in. 586 in. 586 1/2 in. 587 in. 587 1/2 in. 588 in. 588 1/2 in. 589 in. 589 1/2 in. 590 in. 590 1/2 in. 591 in. 591 1/2 in. 592 in. 592 1/2 in. 593 in. 593 1/2 in. 594 in. 594 1/2 in. 595 in. 595 1/2 in. 596 in. 596 1/2 in. 597 in. 597 1/2 in. 598 in. 598 1/2 in. 599 in. 599 1/2 in. 600 in. 600 1/2 in. 601 in. 601 1/2 in. 602 in. 602 1/2 in. 603 in. 603 1/2 in. 604 in. 604 1/2 in. 605 in. 605 1/2 in. 606 in. 606 1/2 in. 607 in. 607 1/2 in. 608 in. 608 1/2 in. 609 in. 609 1/2 in. 610 in. 610 1/2 in. 611 in. 611 1/2 in. 612 in. 612 1/2 in. 613 in. 613 1/2 in. 614 in. 614 1/2 in. 615 in. 615 1/2 in. 616 in. 616 1/2 in. 617 in. 617 1/2 in. 618 in. 618 1/2 in. 619 in. 619 1/2 in. 620 in. 620 1/2 in. 621 in. 621 1/2 in. 622 in. 622 1/2 in. 623 in. 623 1/2 in. 624 in. 624 1/2 in. 625 in. 625 1/2 in. 626 in. 626 1/2 in. 627 in. 627 1/2 in. 628 in. 628 1/2 in. 629 in. 629 1/2 in. 630 in. 630 1/2 in. 631 in. 631 1/2 in. 632 in. 632 1/2 in. 633 in. 633 1/2 in. 634 in. 634 1/2 in. 635 in. 635 1/2 in. 636 in. 636 1/2 in. 637 in. 637 1/2 in. 638 in. 638 1/2 in. 639 in. 639 1/2 in. 640 in. 640 1/2 in. 641 in. 641 1/2 in. 642 in. 642 1/2 in. 643 in. 643 1/2 in. 644 in. 644 1/2 in. 645 in. 645 1/2 in. 646 in. 646 1/2 in. 647 in. 647 1/2 in. 648 in. 648 1/2 in. 649 in. 649 1/2 in. 650 in. 650 1/2 in. 651 in. 651 1/2 in. 652 in. 652 1/2 in. 653 in. 653 1/2 in. 654 in. 654 1/2 in. 655 in. 655 1/2 in. 656 in. 656 1/2 in. 657 in. 657 1/2 in. 658 in. 658 1/2 in. 659 in. 659 1/2 in. 660 in. 660 1/2 in. 661 in. 661 1/2 in. 662 in. 662 1/2 in. 663 in. 663 1/2 in. 664 in. 664 1/2 in. 665 in. 665 1/2 in. 666 in. 666 1/2 in. 667 in. 667 1/2 in. 668 in. 668 1/2 in. 669 in. 669 1/2 in. 670 in. 670 1/2 in. 671 in. 671 1/2 in. 672 in. 672 1/2 in. 673 in. 673 1/2 in. 674 in. 674 1/2 in. 675 in. 675 1/2 in. 676 in. 676 1/2 in. 677 in. 677 1/2 in. 678 in. 678 1/2 in. 679 in. 679 1/2 in. 680 in. 680 1/2 in. 681 in. 681 1/2 in. 682 in. 682 1/2 in. 683 in. 683 1/2 in. 684 in. 684 1/2 in. 685 in. 685 1/2 in. 686 in. 686 1/2 in. 687 in. 687 1/2 in. 688 in. 688 1/2 in. 689 in. 689 1/2 in. 690 in. 690 1/2 in. 691 in. 691 1/2 in. 692 in. 692 1/2 in. 693 in. 693 1/2 in. 694 in. 694 1/2 in. 695 in. 695 1/2 in. 696 in. 696 1/2 in. 697 in. 697 1/2 in. 698 in. 698 1/2 in. 699 in. 699 1/2 in. 700 in. 700

**Shovels and Tongues**

Brass Head.....	60c	50c	10c
Iron Head.....	60c	50c	10c
<b>Sieves and Sifters</b>			
Hunter's Imitation, gro.	\$10.00	\$10.50	
Buffalo Metallic Blue, S. & Co., # gr.			
14x16	18x18	18x19	
\$12.90	\$15.80	\$15.00	
Electric Light.....	\$ gr.	\$12.00	
Hunter's Genuine.....	\$ gr.	\$12.50	
Shaker (Barber's Pat.) Flour Sifters.....	\$ dos.	\$2.00	

**Sieves, Tin Rim**

Inch.....	14	16	18	20
Black, full size.....	\$0.55	\$0.55	\$0.55	\$0.55
Plated, full size.....	\$1.05	\$1.05	\$1.05	\$1.05
Black, scant.....	\$0.75	\$0.75	\$0.75	\$0.75

**Sieves, Wooden Rim**

Mesh 10, 11 and 12 inch.....	\$0.75	\$0.75	\$0.75	\$0.75
Mesh 15, 16, 18, 20.....	\$0.75	\$0.75	\$0.75	\$0.75
Mesh 15, 16, 18, 20.....	\$0.75	\$0.75	\$0.75	\$0.75

**Sinks—Cast Iron**

Standard list.....	60¢	60¢	10%
NOTE.—There is not entire uniformity in lists used by jobbers.			

**Wrought Steel**

Columbus Galv'd and Enamelled.....	\$0.45	\$0.45	\$0.45	\$0.45
Columbus, Painted.....	\$0.45	\$0.45	\$0.45	\$0.45
L. & G. Mfg. Co., Galvanized.....	\$0.50	\$0.50	\$0.50	\$0.50
L. & G. Mfg. Co., Enamelled.....	\$0.50	\$0.50	\$0.50	\$0.50

**Skels, Wagon**

Cast Iron.....	70c	10c	75c	
Malleable Iron.....	10c	10c	50c	
Steel.....	10c	10c	10c	

**Slates**

"D" Slates.....	10c	10c	10c	
Unexcelled Noiseless Slates.....	60c	10c	10c	10c
Wire Bound.....	\$0.50	\$0.50	\$0.50	\$0.50

**Double Slates, add 1 case, net.**

Slaw Cutters—See Cutters.				
Slicers, Vegetable.....	\$8.50	\$8.50	\$8.50	\$8.50
Sterling \$2.00.....	\$8.50	\$8.50	\$8.50	\$8.50

**Snaps, Harness**

German.....	10c	10c	10c	
Covert Mfg. Co.:.....				
Derby.....	\$5.25	\$5.25	\$5.25	\$5.25

**High Grade**

Jockey.....	\$4.25	\$4.25	\$4.25	\$4.25
Trojan.....	\$5.25	\$5.25	\$5.25	\$5.25
Tankoe.....	\$5.25	\$5.25	\$5.25	\$5.25

**Yankee Roller**

Banner.....	60¢10%
Crown.....	60¢10%
Model.....	60¢10%
Triumph.....	60¢10%

Banner.....	\$0.60	\$0.60	\$0.60	\$0.60
Crown.....	\$0.60	\$0.60	\$0.60	\$0.60
Model.....	\$0.60	\$0.60	\$0.60	\$0.60
Triumph.....	\$0.60	\$0.60	\$0.60	\$0.60

**W. & E. T. Fitch Co.:**

Bristol.....	40c	10c		
Empire.....	\$0.50	\$0.50	\$0.50	\$0.50
German.....	\$0.40	\$0.40	\$0.40	\$0.40

**National**

National.....	\$0.50	\$0.50	\$0.50	\$0.50
Perfect.....	\$0.45	\$0.45	\$0.45	\$0.45
Clipper.....	\$0.40	\$0.40	\$0.40	\$0.40

**Champion**

Champion.....	\$0.40	\$0.40	\$0.40	\$0.40
Security.....	\$0.40	\$0.40	\$0.40	\$0.40
Victor.....	\$0.40	\$0.40	\$0.40	\$0.40

**Onida Community:**

Onida Steel.....	\$0.50	\$0.50	\$0.50	\$0.50
Solid Steel.....	\$0.50	\$0.50	\$0.50	\$0.50
Solid Wire.....	\$0.50	\$0.50	\$0.50	\$0.50

**Sargent's Patent Guarded**

Spoons and Forks—				
Silver Plated—				
Good Quality	50¢	10¢	50¢	10¢

**Scythe**

<b>Miscellaneous—</b>				
German Silver.....	60¢	10¢	50¢	10¢
<b>Tinned Ice, —</b>				

**Soldering Irons**

Tables.....	per gro. 90c@	\$1.00
<b>Springs-</b>		
<b>Door-</b>		

**See Trimmers, Spoke**

Star (Coll).....	307
Torrey's Rod, 39 in.... 7 doz.	\$1.10@1.25
Victor (Coll).....	59@10@107

**Silver Plated**

Silver Plated.....	\$0.50	\$0.50	\$0.50	\$0.50
Good Quality.....	\$0.50	\$0.50	\$0.50	\$0.50
Cheap.....	\$0.50	\$0.50	\$0.50	\$0.50

**Miscellaneous**

German Silver.....	\$0.50	\$0.50	\$0.50	\$0.50
Tinned Iron.....	\$0.50	\$0.50	\$0.50	\$0.50
Tables.....	\$0.50	\$0.50	\$0.50	\$0.50

**Doors**

Gem (Coll).....	20c			
Star (Coll).....	30c			
Torrey's Rod, 30 in.....	\$1.10	\$1.10	\$1.10	\$1.10

**Carriage, Wagon, &c.**

Factory Shipments.....				
14 in. and wider.....	Blk. Hf. Brt. Brt.			
4 1/2 x 5	5	5 1/2 x 6		

**Cliff's Bolster Springs**

Cliff's Bolster Springs.....	\$0.30	\$0.30	\$0.30	\$0.30
Cliff's Seat Springs.....	\$0.30	\$0.30	\$0.30	\$0.30

**Sprinklers, Lawn**

Enterprise.....	\$0.35	\$0.35	\$0.35	\$0.35
Philadelphia No. 1, # dos. 11 1/2; No. 2, # dos. 11 1/2; No. 3, # dos. 11 1/2.....	\$0.35	\$0.35	\$0.35	\$0.35

**Squares**

Nickel plated.....	List Jan. 5, 1900			
Steel and Iron.....	70c	10c	75c	
Rosewood Hdl. Try Square and T-Bevels.....	\$0.60	\$0.60	\$0.60	\$0.60

**Iron Hdl. Try Squares and T-Bevels**

Disston's Try Sq. and T-Bevels.....	\$0.60	\$0.60	\$0.60	\$0.60
Winstonsbottom's Try and Miter.....	\$0.60	\$0.60	\$0.60	\$0.60

**Squeezers**

Wood, Common, gro., No. 2, \$5.25.....	\$5.25	\$5.25	\$5.25	\$5.25
Wood, Porcelain Lined.....	\$5.25	\$5.25	\$5.25	\$5.25

**Good Grade**

Good Grade.....	\$0.30	\$0.30	\$0.30	\$0.30
Tinned Iron.....	\$0.30	\$0.30	\$0.30	\$0.30
Iron, Porcelain Lined.....	\$0.30	\$0.30	\$0.30	\$0.30

**Jenaling's Star**

Jenaling's Star.....	\$0.30	\$0.30	\$0.30	\$0.30
King.....	\$0.30	\$0.30	\$0.30	\$0.30

**Staples**

Barbed Blind.....	7c	7c	7c	7c
-------------------	----	----	----	----

**Electricians' Association list**

Electricians' Association list.....	80c	10c	10c	10c
Fence Staples, same price as Barbed Wire. See Trade Report.				
Poultry Netting, Staples.....	\$4.00	\$4.00	\$4.00	\$4.00

**Grand Crossing Tack Co.'s list**

Dick's.....	40%
Foster Bros'.....	80%
C. & A. Hoffmann's.....	40%

**Dick's**

Dick's.....	40c			
Foster Bros'.....	80c			
O. & A. Hoffmann's.....	40c			

**Steelyards**

Gardner De Sticks, larger size.....	40
Green River.....	85
Lightning Screw Plate.....	85
Little Giant.....	85

**Blacksmiths**

Blacksmiths.....	10c	10c	10c	10c
Gardner Die Stocks No. 1.....	50c			
Gardner Die Stocks, larger sizes.....	40c			

**Green River**

Green River.....	25c			
Lightning Screw Plate.....	25c			
Little Giant.....	25c			

**Reece's New Screw Plates**

Reece's New Screw Plates.....	25c			
Ortvis Reversible Ratchet Die Stock.....	25c			

**Stone**

Leader Red End S. S. ....	5 gro	\$4.50
Balance of 1901 list 38 1/2 c.		
<b>Oil Stones, &amp;c.</b>		

**Chicago Wheel & Mfg. Co.**

Chicago Wheel & Mfg. Co.....	\$10.00			
Gem Corundum, 10 inch, \$10.00 per gro., 12 inch, \$12.00.....	\$10.00			

**Cleveland Stone Co., list Nov. '92**

Cleveland Stone Co., list Nov. '92.....	\$12.35			
Pike Mfg. Co. 1901 list:				

**Black Diamond S. S.**

Black Diamond S. S.....	\$ gr.	\$11.00		
Lamotte S. S.....	\$ gr.	\$8.00		
White Mountain S. S.....	\$ gr.	\$8.00		

**Green Mountain S. S.**

Green Mountain S. S.....	\$ gr.	\$8.00		
Extra Indian Pond S. S.....	\$ gr.	\$7.50		
No. 1 Indian Pond S. S.....	\$ gr.	\$7.00		

**No. 2 Indian Pond S. S.**

No. 2 Indian Pond S. S.....	\$ gr.	\$4.50		
Leader Red End S. S.....	\$ gr.	\$4.50		
Balance of 1901 list.....	\$ gr.	\$4.50		

**Oil Stones, &c.**

Oil Stones, &c.....	\$0.50			
Chicago Wheel & Mfg. Co.:.....				

**Corundum Oil, Double Grit**

Corundum Oil, Double Grit.....	\$0.50			
Corundum Oil, Double Grit.....	\$0.50			

**Pike Mfg. Co. 1901 list:**

Pike Mfg. Co. 1901 list.....	\$0.50			
Arkansas Stone, No. 1, 3 to 5 in.....	\$2.50			
Arkansas Stone, No. 1, 5 to 8 in.....	\$3.50			

**Arkansas Stone, No. 1, 8 to 12 in.**

Arkansas Stone, No. 1, 8 to 12 in.....	\$4.00			
Lily White Washita 4 to 8 in.....	\$0.60			
Rosy Red Washita 4 to 8 in.....	\$0.60			

**Washita Stone, Extra, 4 to 8 in.**

Washita Stone, Extra, 4 to 8 in.....	\$0.60			
Washita Stone, No. 1, 4 to 8 in.....	\$0.60			
Washita Stone, No. 2, 4 to 8 in.....	\$0.60			

**Lily White Slips**

Lily White Slips.....	\$0.60			
Rosy Red Slips.....	\$0.60			
Washita Slips, Extra.....	\$0.60			

**Washita Slips, No. 1**

Washita Slips, No. 1.....	\$0.60			
Washita Slips, No. 2.....	\$0.60			
Washita Slips, No. 3.....	\$0.60			

**India Oil Stones (entire list)**

India Oil Stones (entire list).....	\$0.60			
Hindustan No. 1, Regular.....	\$0.60			
Hindustan No. 1, Small.....	\$0.60			

**Axe Stones (all kinds)**

Axe Stones (all kinds).....	\$0.60			
Turkey Oil Stones, ex. 5 to 8 in.....	\$0.60			
Queer Creek Stones, 4 to 8 in.....	\$0.60			

**Queer Creek Slips, No. 1**

Queer Creek Slips, No. 1.....	\$0.60			
Sand Stone.....	\$0.60			
Belgian, German and Swaty Razor Hones.....	\$0.60			

**Natural Grit Carving Knife Hones**

Natural Grit Carving Knife Hones.....	\$0.60			
Quick Edge Pocket Knife Hones.....	\$0.60			
Quick Edge Pocket Knife Hones.....	\$0.60			

**Mounted Kitchen Sand Stone**

Mounted Kitchen Sand Stone.....	\$0.60			
Tanite Mills.....	\$0.60			
Emery Oil, # dos. \$5.00.....	\$5.00			

**Stones—Cherry**

Stones—Cherry.....	\$0.50			
Enterprise.....	\$0.50			

**Stops, Bench**

Stops, Bench.....	\$0.50			
Millers Falls.....	\$0.50			
Morrill's.....	\$0.50			



**Washers—**  
**Leather, Axle—**  
Solid.....80¢10¢10¢85¢  
Patent.....85¢10¢85¢20¢  
Coil: 7/8 1 1 1/4 1 1/2  
11c 11c 11c 15c per 100  
**Iron or Steel—**  
Size bolt....5-16 3/4 1/2 5/8 3/4  
Washers.....\$5.80 1.30 3.00 2.80 2.60  
In lots less than one keg add 1/4c per lb.  
6-lb. boxes add 1/4c to list.  
**Cast Washers—**  
Over 1/2 inch, barrel lots, per lb.....1 1/4¢1 1/4c  
**Washer Cutters—**  
See Cutters, Washer.  
**Washing Machines—**  
See Machines, Washing.  
**Water Coolers—**  
See Coolers, Water.  
**Wedges—**  
Oil Finish.....lb. \$ .90@3.10c  
**Weights, Sash—**  
Per ton.....\$19.00@22.50  
Some Foundries make price \$12@13 lower.

**Well Buckets, Galvanized**  
See Pails, Galvanized.  
**Wheels Well—**  
8-in., \$1.65 to 1.75; 10-in., \$2.00 to 2.10;  
12-in., \$2.50 to 2.75; 14-in., \$3.25 to 3.40  
**Wire and Wire Goods—**  
Brt. and Ann., 6 to 9, 70¢10¢70¢10¢5¢  
Brt. and Ann., 10 to 13, 75¢10¢71¢10¢5¢  
Brt. and Ann., 19 to 25, 75¢10¢71¢10¢5¢  
Brt. and Ann., 27 to 35.....75¢10¢71¢10¢5¢  
75¢10¢5¢75¢10¢71¢10¢5¢  
Cop'd and Galv., 6 to 9.....70¢10¢70¢10¢5¢  
Cop'd and Galv., 10 to 11.....70¢10¢70¢10¢5¢  
70¢10¢70¢10¢5¢  
Cop'd and Galv., 19 to 25.....75¢10¢75¢10¢5¢  
75¢10¢75¢10¢5¢  
Cop'd and Galv., 27 to 35.....75¢10¢75¢10¢5¢  
75¢10¢75¢10¢5¢  
Tinned, 6 to 14.....75¢10¢75¢10¢5¢  
Tinned, 15 to 18.....70¢10¢70¢10¢5¢  
Tinned, 19 to 25.....70¢10¢70¢10¢5¢  
Tinned, 27 to 35.....65¢10¢70¢10¢5¢  
Annealed Wire on Spools.....70¢10¢70¢10¢5¢  
Brass and Copper Wire on Spools.....  
60¢10¢50¢10¢5¢  
Brass, list Feb. 26, '98.....25¢

Copper, list Feb. 26, '98.....18¢  
Cast Steel Wire.....50¢  
Stub's Steel Wire.....\$5.00 to \$5.40¢  
Wire Clothes Line, see Lines.  
Wire Picture Cord, see Cord.  
**Bright Wire Goods—**  
List April 1, 1901.....85¢35¢10¢  
**Wire Cloth and Netting—**  
Galvanized Wire Netting.....35¢35¢5¢  
Painted Screen Cloth per 100 ft.....\$1.00 to 1.10  
**Light Hardware Grade:**  
2-8 Mesh, Plain (3c. list) sq. ft.....1 1/4c  
2-8 Mesh, Galv. (3c. list) sq. ft.....1 1/4c  
**Wire Barb—See Trade Report.**  
**Wire, Rope—See Rope, Wire.**  
**Wrenches—**  
Agricultural.....70¢10¢75¢10¢5¢  
Case lots.....75¢10¢5¢  
Acme.....80¢10¢5¢  
Baxter's.....70¢10¢5¢  
Coe's Genuine.....40¢10¢5¢5¢  
Coe's "Mechanics".....40¢10¢5¢5¢  
Alligator.....60¢10¢10¢5¢  
Bemis & Cull's.....  
Adjustable S.....35¢5¢

Adjustable S Pipe.....40¢  
Brigg's Pattern.....80¢10¢  
Combination Black.....40¢  
Combination Bright.....40¢  
Cylinder or Gas Pipe.....50¢  
Extra Heavy.....45¢  
Merriek's Pattern.....50¢  
No. 3 Pipe, Bright.....50¢  
Bridley Automatic.....90¢  
Boardman's.....40¢10¢  
Donohue's Engineer.....50¢10¢  
Eagle.....50¢10¢  
Gem Pocket.....30¢  
Hercules.....50¢10¢  
Knife Handle, Machinists' (W. & B.)  
Case lots.....80¢10¢  
Less than case lots.....50¢5¢  
Improved Pipe (W. & B.).....6¢  
Solid Handles, P. S. & W.....50¢10¢  
Stevenson.....60¢10¢10¢  
**Wrought Goods—**  
Staples, Hooks, etc., list March 17  
'98.....85¢10¢85¢10¢  
**Yokes, Neck—**  
Covert Saddlery Works, Trimmed 1.00¢25¢  
Covert Saddlery Works, Neck Yoke  
Centers.....70¢  
**Yokes, Ox, and Ox Bows—**  
Fort Madison's Farmers & Freighters.....  
list not  
**Zinc—**  
Sheet.....lb 6 1/4¢@7¢

PAINTS, OILS AND COLORS.—Wholesale Prices!

**White Lead, Zinc, &c.**  
Lead, Foreign white, in Oil.....7 1/4¢ 6 1/4¢  
Lead, American White, in Oil:  
Lots of 500 lb or over.....6 1/4¢  
Lots less than 500 lb.....7¢  
Lead, White, in oil, 25 lb tin  
pails, add to keg price.....3¢  
Lead, White, in oil, 19 1/2 lb tin  
pails, add to keg price.....1¢  
Lead, White, in oil, 1 to 5 lb as-  
sorted tins, add to keg price.....1 1/4¢  
Lead White, Dry in bbls.....5 1/4¢ 6¢  
Lead, American, Terms: On lots of 500  
lbs. and over, 60 days, or 2% for cash if  
paid in 15 days from date of invoice.  
Zinc, American, dry.....7 1/4¢ 4 1/2¢ 4 1/2¢  
Zinc, Paris, Red Seal, dry.....8 1/2¢  
Zinc, Paris, Green Seal, dry.....9 1/2¢  
Zinc, Antwerp, Red Seal, dry.....8 1/2¢  
Zinc, Antwerp, Green Seal, dry.....7 1/2¢  
Zinc, V. M. French, in Poppy Oil,  
Green Seal:  
Lots of 1 ton and over.....12¢ 12 1/2¢  
Lots of less than 1 ton.....12 1/2¢ 12 1/2¢  
Zinc, V. M. French, in Poppy Oil,  
Red Seal:  
Lots of 1 ton and over.....10 1/2¢ 11 1/4¢  
Lots of less than 1 ton.....11 1/4¢ 11 1/4¢  
Discounts.—V. M. French Zinc.—Dis-  
counts to buyers of 10 bbl. lots of one or  
assorted grades, 1% ; 25 bbls., 2% ; 50  
bbls., 4% .  
**Dry Colors.**  
Black, Carbon.....7 1/2¢ 8¢ 30¢  
Black, Drop, Amer.....4¢ 7¢  
Black, Drop, Eng.....7¢ 11¢  
Black, Ivory.....4¢ 9¢  
Lamp, Con.....4 1/2¢ 6¢  
Blue, Celestial.....7 1/2¢ 4¢ 6¢  
Blue, Chinese.....30¢ 35¢  
Blue, Prussian.....23¢ 34¢  
Blue, Ultramarine.....4¢ 30¢  
Brown, Spanish.....1 1/2¢ 1¢  
Brown, Vandyke, Amer.....14¢ 2 1/4¢  
Brown, Vandyke, Foreign.....3 1/4¢ 3 1/4¢  
Carmine, No. 40.....7 1/2¢ 22.75¢  
Green, Chrome, ordinary.....5¢ 5 1/4¢

Green, Chrome, pure.....16¢ 20¢  
Lead, Red, bbls. 1/2 bbls. and kegs:  
Lots 500 lb or over.....6¢  
Lots less than 500 lb.....6 1/4¢  
Litharge, bbls. 1/2 bbls. and kegs:  
Lots 500 lb or over.....6¢  
Lots less than 500 lb.....6 1/4¢  
Ocher, French Washed.....11.35¢ 2.50¢  
Ocher, Dutch Washed.....4 1/2¢ 5¢  
Ocher, American.....7 ton 10.00¢ 15.00¢  
Orange Mineral, English.....11.3¢ 11 1/4¢  
Orange Mineral, German.....8 1/4¢ 9 1/4¢  
Orange Mineral, American.....8¢ 8 1/4¢  
Red, Indian, English.....4 1/2¢ 8 1/4¢  
Red, Indian, American.....3¢ 3 1/4¢  
Red, Turkey, English.....4¢ 6¢  
Red, Tuscan, English.....7¢ 10¢  
Red, Venetian, Amer.....7 100¢ 1.75¢  
Red, Venetian, English.....1.80¢ 3.00¢  
Sienna, Italian, Burnt and  
Powdered.....7 1/2¢ 8 1/4¢ 7 1/4¢  
Sienna, Ital., Raw, Powd.....5 1/2¢ 7 1/4¢  
Sienna, American, Raw.....1 1/2¢ 3¢  
Sienna, American, Burnt and  
Powdered.....7 1/2¢ 1 1/2¢ 3¢  
Talc, French.....7 100 lb 1.25¢ 1.50¢  
Talc, American......90¢ 1.10¢  
Terra Alba, French, 7 100 lb......95¢ 1.00¢  
Terra Alba, English......95¢ 1.00¢  
Terra Alba, American No. 1......85¢  
Terra Alba, American No. 2......45¢ 50¢  
Umber, Turkey, Bnt. & Pow. 7 1/2¢ 3 1/4¢  
Umber, Turkey, Raw & Powd.....1 1/2¢ 3¢  
Umber, Bat. Amer......14¢ 2¢  
Umber, Raw, Amer......14¢ 2¢  
Yellow, Chrome.....10 1/2¢ 25¢  
Vermillion, American Lead.....10¢ 40¢  
Vermillion, Quicksilver, bulk......72¢  
Vermillion, Quicksilver, bags......73¢  
Vermillion, English, Import......95¢ 25¢  
Vermillion, Chinese......1.00¢ 1.20¢  
**Colors in Oil.**  
Black, Lampblack.....19¢ 14¢  
Blue, Chinese......36¢ 40¢  
Blue, Prussian......32¢ 38¢  
Blue, Ultramarine......13¢ 16¢

Brown, Vandyke.....9 1/4¢ 13¢  
Green, Chrome.....10¢ 12¢  
Green, Paris......9 1/4¢  
Sienna, Raw......10¢ 13¢  
Sienna, Burnt......10¢ 13¢  
Umber, Raw.....9 1/4¢ 13¢  
Umber, Burnt.....9 1/4¢ 13¢  
**Miscellaneous.**  
Barytes, Foreign, 7 ton.....19.00¢ 31.00¢  
Barytes, Amer. floatd.....19.00¢ 30.00¢  
Barytes, Crude.....9.00¢ 10.00¢  
Chalk, in bulk.....7 ton 3.00¢ 3.00¢  
Chalk, in bbls.....7 100 lb .35¢ .35¢  
China Clay, English, 7 ton 12.00¢ 17.50¢  
Cobalt, Oxide.....7 100 lb 2.25¢ 2.50¢  
Whiting, Common, 7 100 lb .40¢ .60¢  
Whiting, Gliders......45¢ .65¢  
Whiting, extra Gliders......55¢ .65¢  
**Putty.**  
In bulk......1.00¢  
In bladders......2.25¢  
In cans, 1 lb to 5 lb......2.25¢  
In cans, 1 lb to 5 lb......2.25¢  
**Spirits Turpentine.**  
In Southern bbls.....35¢ 43¢ 6¢  
In machine bbls.....35¢ 43¢ 6¢  
**Glue.**  
Low Grade.....7 1/2¢ 9¢ 12¢  
Cabinet.....11 1/4¢ 18¢  
Medium White.....14 1/4¢ 18 1/4¢  
Extra White.....18¢ 23¢  
French......12¢ 40¢  
Irish......13¢ 16¢  
**Animal, Fish and Vege-  
table Oils.**  
Linseed, City, raw.....7 gal. 61¢ 62¢

Linseed, City, boiled.....63¢ 64¢  
Linseed, State and West'n, raw 50¢ 60¢  
Linseed, raw Calcutta seed......55¢  
Lard, Prime.....70¢ 71¢  
Lard, Extra No. 1.....50¢ 52¢  
Lard, No. 1.....41¢ 43¢  
Cotton-seed, Crude.....3 1/4¢ 34¢  
Cotton-seed, Summer Yellow,  
prime.....85¢ 88¢  
Cotton-seed Summer Yellow,  
off grades.....35¢ 35 1/2¢  
Sperm, Crude......6¢  
Sperm, Natural Spring......6¢  
Sperm, Bleached Spring......6¢  
Sperm, Natural Winter.....61¢ 62¢  
Sperm, Bleached Winter.....64¢ 65¢  
Whale, Crude......45¢  
Whale, Natural Winter......45¢  
Whale, Bleached Winter......47¢  
Menhaden, Crude, Sound.....28¢ 29¢  
Menhaden, Light Strained.....33¢ 33¢  
Menhaden, Bleached Winter.....35¢ 35¢  
Menhaden, Ex Bleached Winter 35¢ 39¢  
Tallow, prime.....52¢ 53¢  
Cocoanut, Ceylon.....5 1/4¢ 6¢  
Cocoanut, Coochin.....6 1/4¢ 6 1/4¢  
Cod, Domestic.....83¢ 84¢  
Cod, Newfound.....85¢ 87¢  
Red Haine......34¢ 38¢  
Red Saponified.....7 1/2¢ 4 1/2¢ 5¢  
Olive, Italian, bbls.....62¢ 67 1/2¢  
Neatsfoot, prime.....52¢ 54¢  
Palm, prime, Lagos.....7 1/2¢ 5 1/4¢ 5 1/4¢  
**Mineral Oils.**  
Black, 20 gravity, 25¢ 30¢ cold  
test.....7 gal. 93¢ 101¢  
Black, 30 gravity, 15¢ cold test. 104¢ 111¢  
Black, summer.....94¢ 94¢  
Cylinder, light filtered.....14 1/4¢ 17¢  
Cylinder, dark filtered.....11 1/4¢ 16¢  
Paraffine, 903-907 gravity.....12 1/4¢ 12 1/4¢  
Paraffine, 903 gravity.....11 1/4¢ 11 1/4¢  
Paraffine, 883 gravity.....9 1/4¢ 10¢  
Paraffine, red, No.....12 1/4¢ 12 1/4¢  
In small lots 1/4¢ advance.

THE IRON AGE.

The oldest paper in the world devoted to the interests of the Hardware, Iron, Machinery and Metal Trades, and a standard authority on all matters relating to these branches of industry.

RATES OF SUBSCRIPTION: INCLUDING POSTAGE.

UNITED STATES AND BRITISH AMERICA.

Regular Edition, Issued every THURSDAY morning, \$5.00 a year  
Two Dollar Edition, large number FIRST and THIRD THURSDAYS of every month, Bulletin number each intervening Thursday, 2.00 "  
Dollar Edition, large number FIRST THURSDAY of every month, Bulletin number each intervening Thursday, 1.00 "

RATES OF ADVERTISING: ONE INCH.

ONE INSERTION, - - - - - \$3.00  
ONE MONTH, (3 times) - - - - - 11.25  
THREE MONTHS, - - - - - 26.25  
SIX MONTHS, - - - - - \$45.00  
ONE YEAR, - - - - - 75.00  
Rates for larger spaces quoted on application.

New York (Main Office), 232-238 William Street, DAVID WILLIAMS CO., Pub'rs.  
Philadelphia, Forrest Building, 117 119 South Fourth Street, THOMAS HOBSON, Manager.  
Pittsburgh, Hamilton Building, 335-337 Fifth Avenue, ROBERT A. WALKER, Manager.  
Chicago, Fisher Building, Dearborn and Van Buren Streets, (I. H. ROBERTS, Business Manager.  
Cincinnati, Pickering Building, 5th and Main Streets, GEO. W. COPE, Resident Asso. Ed.  
St. Louis, Chemical Building, 721 Olive Street, HENRY SMITH, Manager.  
Boston, Mason Building, 70 Kilby Street, C. F. WIELAND, Manager.  
Cleveland, The Cuyahoga, 311 Superior Street, WALTER C. ENGLISH, Manager.  
EZRA S. ADAMS, Manager.

LONDON OFFICE: Hastings House, Norfolk Street, Strand.

AUSTRALIAN OFFICES: Melbourne, Hardware Chambers, 231 Elizabeth Street; Sydney, Palings Building.

Remittances should be made by draft, payable to the order of DAVID WILLIAMS COMPANY, on any banking house in the United States or Europe, or by P. O. Money Order on New York. When these cannot be obtained, postage stamps of any country will be received.  
Newsdealers or Bookstellers in any part of the world may obtain The Iron Age through the American News Company, New York, U. S. A.; The International News Company, New York, U. S. A.; and London, England; or The San Francisco News Company, San Francisco, Cal., U. S. A.

Entered at the Post Office, New York, as Second-class Matter.

# CURRENT METAL PRICES.

APRIL 21, 1901.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL— Bar Iron from Store—	
Common Iron: Duty, Round, 0.6¢ # 2; Square, 0.8¢ # 2	
1 to 1½ in. round and square	1.75¢ @ 1.85¢
1½ to 4 in. x ½ to 1 in.	
Refined Iron:	
1 to 1½ in. round and square	1.80¢ @ 1.90¢
1½ to 4 in. x ½ to 1 in.	1.95¢ @ 2.05¢
1½ to 4 in. x ½ to 1 in.	2.15¢ @ 2.25¢
Rods—¾ and 1-16 round and square.	2.15¢ @ 2.25¢
Angles:	
3 in. x ½ in. and larger	2.10¢
3 to 8½ in. x 3-16 in.	2.10¢
1½ to 3 in. x ½ in.	2.20¢
1½ to 2½ in. x 3-16 in. and thicker.	2.10¢
1 to 1½ in. x 3-16 in.	2.20¢
1 to 1½ in. x ½ in.	2.30¢
1½ x ½ in.	2.40¢
1½ x ½ in.	2.50¢
1½ x ½ in.	3.50¢
1½ x 3-16 in.	4.00¢
Tees:	
1 in.	2.60¢
1½ in.	2.40¢
1½ in. and larger	2.30¢
Beams:	
Channels, 8 in. and larger	2.25¢
Bands—1½ to 6 x 3-16 to No. 8	2.20¢
"Burden's Best" Iron, base price	3.15¢
Burden's "H. B. & S. Iron, base price	2.05¢
"Cluter"	3.60¢
Norway Bars	4.45¢
Norway Shapes	4.45¢

Merchant Steel from Store—	
Bessemer Machinery	1.90¢ to 1.95¢
Toe Calk, Tire and Sleigh Shoe	2.00¢ @ 2.50¢
Best Cast Steel, base price in small lots	7½¢
Best Cast Steel Machinery, base price in small lots	8¢
Soft Steel Sheets—	
¼ inch.	2.20¢ No. 14.
8-16 inch.	2.30¢ No. 16.
No. 8.	2.40¢ No. 18.
No. 10.	2.50¢ No. 20.
No. 12.	2.60¢ No. 22.

Sheet Iron from Store.	
Black.	
One Pass, C. R.	R. G.
Soft Steel	Cleaned.
No. 14 to 16.	3.35¢
No. 18 to 21.	3.35¢
No. 22 to 24.	3.45¢
No. 25 and 26.	3.50¢
No. 27.	3.65¢
No. 28.	3.75¢
Russia, Planished, &c.	
Genuine Russia, according to assortment.	10½¢
Patent Planished.	10½¢ A, 9½¢ B, 8½¢ C, net.
Galvanized.	
No. 10 to 16.	12½¢
No. 17 to 21.	13½¢
No. 22 to 24.	14½¢
No. 25 to 26.	15½¢
No. 27.	16½¢
No. 28.	17½¢
No. 30.	18½¢
30 in. 1½ # 2 higher.	19½¢

Foreign Steel from Store—	
Best Cast	15¢
Extra Cast	16¢
Swaged, Cast	16¢
Best Double Shear	16¢
Blister, 1st quality	16¢
German Steel, Best	16¢
2d quality	16¢
3d quality	16¢
Sheet Cast Steel, 1st quality	15¢
2d quality	14¢
3d quality	12¢
R. Mushet's "Special"	16¢
"Titanic" Annealed	17¢
Hobson's Choice XX Extra Best	18¢
Jessop Self Hardening	43¢
Seamans' "Nelson" Steel	40¢
Hobson's "Soho" Special Self-Hardening	43¢

METALS—	
Tin—	
Duty.—Pigs, Bars and Block. Free	Per lb.
Banca, Pig	27¢ @ 27½¢
Straite, Pig	27½¢ @ 28¢
Straite in Bars	27½¢ @ 28¢

Tin Plates—	
American Charcoal Plates.	
Calland Grade:	
IC, 14 x 20.	\$0.75
IX, 14 x 20.	8.25
Melyn Grade:	
IC, 14 x 20.	6.25
IX, 14 x 20.	7.75
Allaway Grade:	
IC, 14 x 20.	5.50
IX, 14 x 20.	6.00
American Coke Plates—Bessemer—	
IC, 14 x 20.	\$4.25 @ 4.40
IX, 14 x 20.	\$4.95 @ 5.00
IX, 14 x 20.	\$7.20 @ 7.25
American Terne Plates—	
IC, 20 x 24.	\$0.59
IX, 20 x 24.	1.15

Tin Boiler Plates, American—	
IX, 14 x 20.	112 sheets. \$12.50
IX, 14 x 20.	112 sheets. 13.50
IX, 14 x 20.	112 sheets. 15.00
Copper—	
Duty.—Pig, Bar and Ingot and Old Copper free	
Manufactured, 2½¢ # lb.	
Ingot—	
Lake	17¼¢ @ 17½¢
Ansonia grade Casting	16¼¢ @ 17¼¢

Sheet and Bolt—																				Net.	
January 10, 1900.																					
Prices, in cents per pound.																					
Sheet 30 x 60.																					
Not wider than		Not longer than		And longer than		64 oz. & over, 3 lb. sheet, 30 x 60 and heavier.		30 oz. to 64 oz. 3 to 30 lb.		34 oz. to 35 lb.		36 oz. to 40 oz.		38 oz. to 42 oz.		40 oz. to 44 oz.		42 oz. to 46 oz.		44 oz. to 48 oz.	
Ins.		Ins.		Ins.		Ins.		Ins.		Ins.		Ins.		Ins.		Ins.		Ins.		Ins.	
30	72	30	96	30	120	30	144	30	168	30	192	30	216	30	240	30	264	30	288	30	312
30	96	30	120	30	144	30	168	30	192	30	216	30	240	30	264	30	288	30	312	30	336
30	120	30	144	30	168	30	192	30	216	30	240	30	264	30	288	30	312	30	336	30	360
30	144	30	168	30	192	30	216	30	240	30	264	30	288	30	312	30	336	30	360	30	384
30	168	30	192	30	216	30	240	30	264	30	288	30	312	30	336	30	360	30	384	30	408
30	192	30	216	30	240	30	264	30	288	30	312	30	336	30	360	30	384	30	408	30	432
30	216	30	240	30	264	30	288	30	312	30	336	30	360	30	384	30	408	30	432	30	456
30	240	30	264	30	288	30	312	30	336	30	360	30	384	30	408	30	432	30	456	30	480
30	264	30	288	30	312	30	336	30	360	30	384	30	408	30	432	30	456	30	480	30	504
30	288	30	312	30	336	30	360	30	384	30	408	30	432	30	456	30	480	30	504	30	528
30	312	30	336	30	360	30	384	30	408	30	432	30	456	30	480	30	504	30	528	30	552
30	336	30	360	30	384	30	408	30	432	30	456	30	480	30	504	30	528	30	552	30	576
30	360	30	384	30	408	30	432	30	456	30	480	30	504	30	528	30	552	30	576	30	600
30	384	30	408	30	432	30	456	30	480	30	504	30	528	30	552	30	576	30	600	30	624
30	408	30	432	30	456	30	480	30	504	30	528	30	552	30	576	30	600	30	624	30	648
30	432	30	456	30	480	30	504	30	528	30	552	30	576	30	600	30	624	30	648	30	672
30	456	30	480	30	504	30	528	30	552	30	576	30	600	30	624	30	648	30	672	30	696
30	480	30	504	30	528	30	552	30	576	30	600	30	624	30	648	30	672	30	696	30	720
30	504	30	528	30	552	30	576	30	600	30	624	30	648	30	672	30	696	30	720	30	744
30	528	30	552	30	576	30	600	30	624	30	648	30	672	30	696	30	720	30	744	30	768
30	552	30	576	30	600	30	624	30	648	30	672	30	696	30	720	30	744	30	768	30	792
30	576	30	600	30	624	30	648	30	672	30	696	30	720	30	744	30	768	30	792	30	816
30	600	30	624	30	648	30	672	30	696	30	720	30	744	30	768	30	792	30	816	30	840
30	624	30	648	30	672	30	696	30	720	30	744	30	768	30	792	30	816	30	840	30	864
30	648	30	672	30	696	30	720	30	744	30	768	30	792	30	816	30	840	30	864	30	888
30	672	30	696	30	720	30	744	30	768	30	792	30	816	30	840	30	864	30	888	30	912
30	696	30	720	30	744	30	768	30	792	30	816	30	840	30	864	30	888	30	912	30	936
30	720	30	744	30	768	30	792	30	816	30	840	30	864	30	888	30	912	30	936	30	960
30	744	30	768	30	792	30	816	30	840	30	864	30	888	30	912	30	936	30	960	30	984
30	768	30	792	30	816	30	840	30	864	30	888	30	912	30	936	30	960	30	984	30	1008
30	792	30	816	30	840	30	864	30	888	30	912	30	936	30	960	30	984	30	1008	30	1032
30	816	30	840	30	864	30	888	30	912	30	936	30	960	30	984	30	1008	30	1032	30	1056
30	840	30	864	30	888	30	912	30	936	30	960	30	984	30	1008	30	1032	30	1056	30	1080
30	864	30	888	30	912	30	936	30	960	30	984	30	1008	30	1032	30	1056	30	1080	30	1104
30	888	30	912	30	936	30	960	30	984	30	1008	30	1032	30	1056	30	1080	30	1104	30	1128
30	912	30	936	30	960	30	984	30	1008	30	1032	30	1056	30	1080	30	1104	30	1128	30	1152
30	936	30	960	30	984	30	1008	30	1032	30	1056	30	1080	30	1104	30	1128	30	1152	30	1176
30	960	30	984	30	1008	30	1032	30	1056	30	1080	30	1104	30	1128	30	1152	30	1176	30	1200
30	984	30	1008	30	1032	30	1056	30	1080	30	1104	30	1128	30	1152	30	1176	30	1200	30	1224
30	1008	30	1032	30	1056	30	1080	30	1104	30	1128	30	1152	30	1176	30	1200	30	1224	30	1248
30	1032	30	1056	30	1080	30	1104	30	1128	30	1152	30	1176	30	1200	30	1224	30	1248	30	1272
30	1056	30	1080	30	1104	30	1128	30	1152	30	1176	30	1200	30	1224	30	1248	30	1272	30	1296
30	1080	30	1104	30	1128	30	1152	30	1176	30	1200	30	1224	30	1248	30	1272	30	1296	30	1320
30	1104	30	1128	30	1152	30	1176	30	1200	30	1224	30	1248	30	1272	30	1296	30	1320	30	1344
30	1128	30	1152	30	1176	30	1200	30	1224	30	1248	30	1272	30	1296	30	1320	30	1344	30	1368
30	1152	30	1176	30	1200	30	1224	30	1248	30	1272	30	1296	30	1320	30	1344	30	1368	30	1392
30	1176	30	1200	30	1224	30	1248	30	1272	30	1296	30	1320	30	1344	30	1368	30	1392	30	1416
30	1200	30	1224	30	1248	30	1272	30	1296	30	1320	30	1344	30	1368	30	1392	30	1416	30	1440
30	1224	30	1248	30	1272	30	1296	30	1320	30	1344	30	1368	30	1392	30	1416	30	1440	30	1464
30	1248	30	1272	30	1296	30	1320	30	1344	30	1368	30	1392	30	1416	30	1440	30	1464	30	1488
30	1272	30	1296	30	1320	30	1344	30	1368	30	1392	30	1416	30	1440	30	1464	30	1488	30	1512
30	1296	30	1320	30	1344	30	1368	30	1392	30	1416	30	1440	30	1464	30	1488	30	1512	30	1536
30	1320	30	1344	30	1368	30	1392	30	1416	30	1440	30	1464	30	1488	30	1512	30	1536	30	1560
30	1344	30	1368	30	1392	30	1416	30	1440	30	1464	30	1488	30	1512	30	1536	30	1560	30	1584
30	1368	30	1392	30	1416	30	1440	30	1464	30	1488	30	1512	30	1536	30	1560	30	1584	30	1608
30	1392	30	1416	30	1440	30	1464	30	1488	30	1512	30	1536	30	1560	30	1584	30	1608	30	1632
30	1416	30	1440	30	1464	30	1488	30	1512	30	1536	30	1560	30	1584	30	1608	30	1632	30	1656
30	1440	30	1464	30	1488	30	1512	30	1536	30	1560	30	1584	30	1608	30	1632	30	1656	30	1680
30	1464	30	1488	30	1512	30	1536	30	1560	30	1584	30	1608	30	1632	30	1656	30	1680	30	1704
30	1488	30	1512	30	1536	30	1560	30	1584	30	1608	30	1632	30	1656	30	1680	30	1704	30	1728
30	1512	30	1536	30	1560	30	1584	30	1608	30	1632	30	1656	30	1680	30	1704	30	1728	30	1752
30	1536	30	1560	30	1584	30	1608	30	1632	30	1656	30	1680	30	1704	30	1728	30	1752	30	1776
30	1560	30	1584	30	1608	30	1632	30	1656	30	1680	30	1704	30	1728	30	1752	30	1776	30	1800
30	1584	30	1608	30	1632	30	1656	30	1680	30	1704	30	1728	30	1752	30	1776	30	1800	30	1824
30	1608	30	1632	30	1656	30	1680	30	1704	30	1728	30	1752	30	1776	30	1800	30	1824	30	1848
30	1632	30	1656	30	1680	30	1704	30	1728	30	1752	30	1776	30	1800	30	1824	30	1848	30	1872
30	1656	30	1680	30	1704	30	1728	30	1752	30	1776	30	1800	30	1824	30	1848	30	1872	30	1896
30	1680	30	1704	30	1728	30	1752	30	1776	30	1800	30	1824	30	1848	30	1872	30	1896	30	1920
30	1704	30	1728	30	1752	30	1776	3													



in.  
40

er

0%

g

20

d

er

4